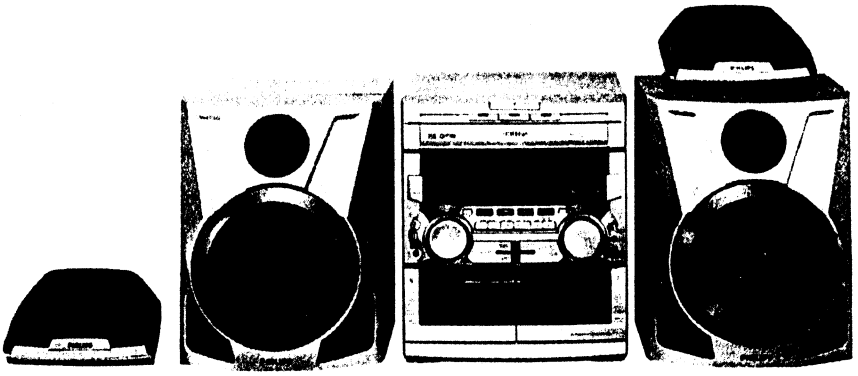
Mini System

FW-C58/21/21M/30

FW-C55/34 & FW-C58/34

FW-C55/22 & FW-C71/37

Service
Service
Service



Service Manual

COMPACT disc DIGITAL AUDIO

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CLASS 1 LASER PRODUCT

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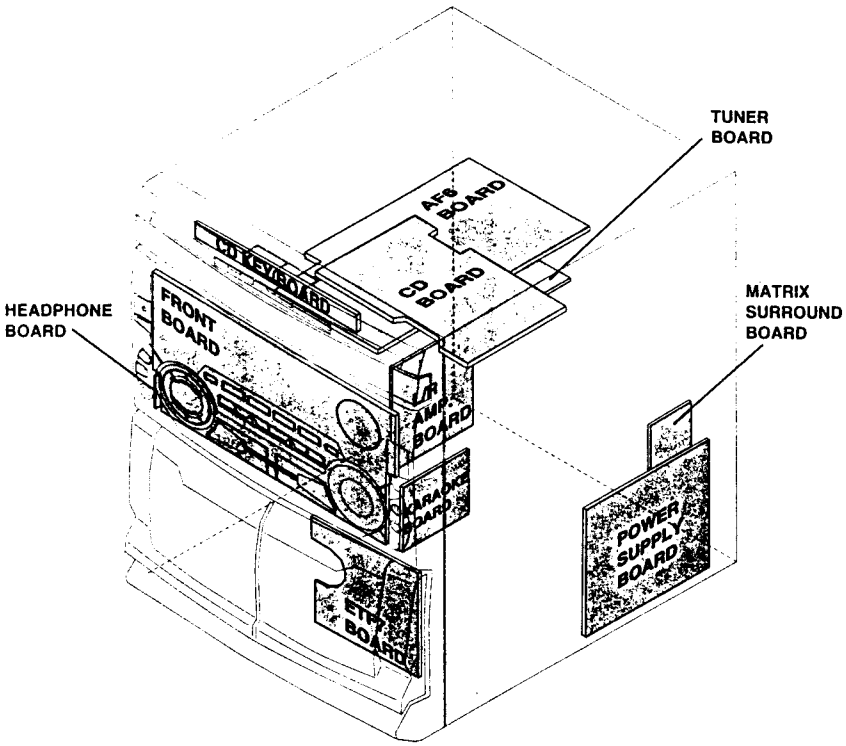
PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	FW-C58				FW-C55		FW-C71	
	/21	/21M	/30	/34	/22	/34	/37	
Aux In	x	x	x	x	x	x	x	
Line Out	x	x	x	x	x	x	x	
Surround Out								
Subwoofer Out	x	x	x	x	x	x	x	
Digital Out	x	x	x	x	x	x	x	
Matrix Surround	x	x	x	x				
CD Text								
Dolby B				x		x		
RDS				x	x	x		
News				x	x	x		
Dolby Prologic (DPL)								
Incredible Surround	x	x	x	x	x	x	x	
Karaoke Features	x	x	x	x	x	x		
Voltage Selector	x	x						
Low Power Standby (Clock Display Off)								
Tuner board - ECO5 Sys	x	x	x	x		x	x	
Tuner board - Tuner 95					x			
Surround speakers	x	x	x	x				

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21/21M
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30

Mains frequency : 50/60Hz
Power consumption : < 15W at Standby
75W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 390mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/21M/37
Grid : 9kHz
10kHz for /21/21M/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 24dB]
IF rejection : [> 26dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 7%]

AMPLIFIER:

Output power (6ohms, 1kHz, 10% THD)
L & R : 2 x 50W
Surround : 2 x 7W

Frequency response within -3dB : 40Hz-20kHz
Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB OFF 1)
Incredible Surround : IS ON (12 steps), IS OFF 1)
Digital Sound Control :
Optimal, Classic, Techno, Jazz, Rock, Vocal 1)

Headphone output at 32 ohms: 15mW ± 2dB

Input sensitivity
Aux in : 1V ± 2dB at 1 kohms
Mic. : 4.5mV ± 2dB at 600 ohms
Output sensitivity
Line out : 500mV ± 2dB at 22 kohms
Subwoofer out (max. vol.) : 1.5V ± 2dB at 22 kohms

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
Wow and flutter : < 0.45% (IEC)
Fast-wind/Rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio (unweighted): > 43dB

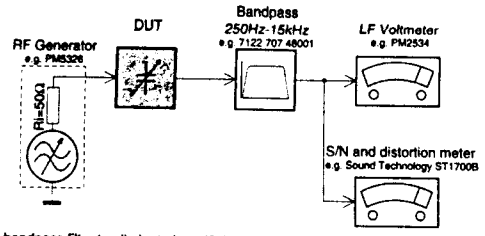
COMPACT DISC:

Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 1dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel unbalance : < ±1dB
Channel separation at 1kHz : > 60dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only
1) Frequency response in each setting is software controlled.

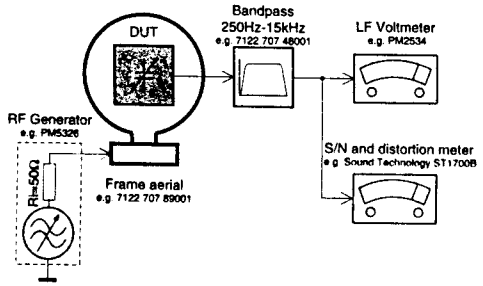
MEASUREMENT SETUP

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

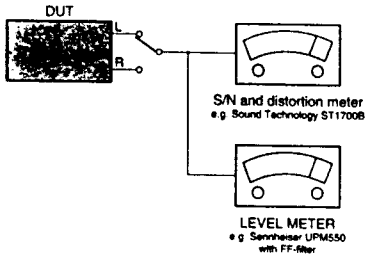
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

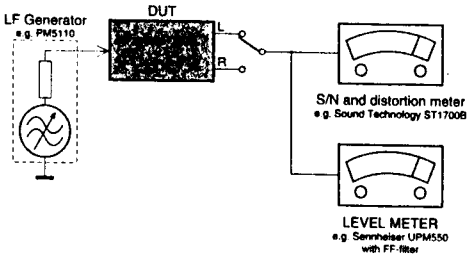
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Recorder

Use Universal Test Cassette CrO2 SBC419 4822 397 30069
or Universal Test Cassette Fe SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

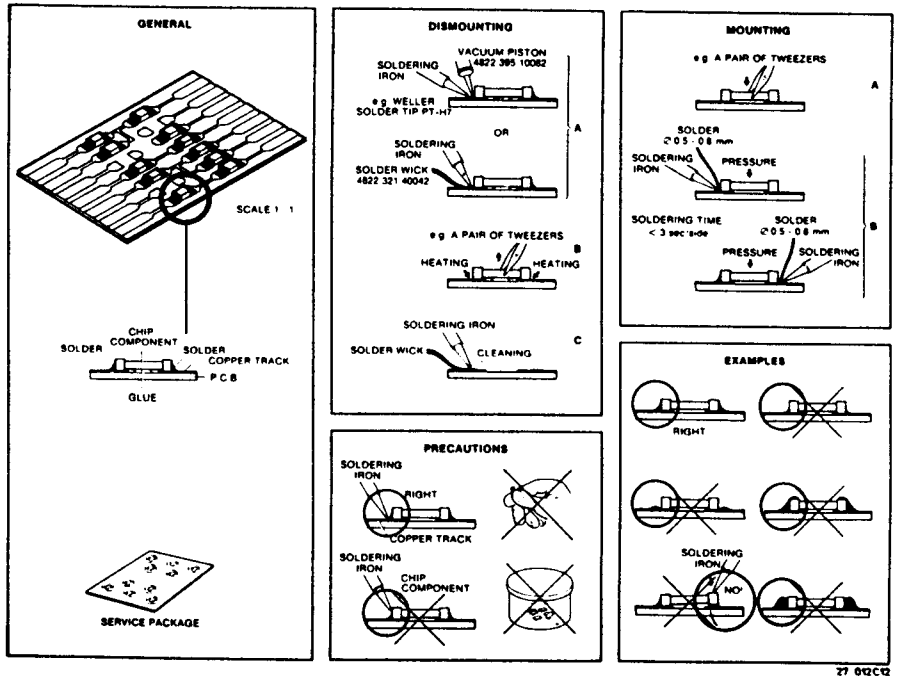
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS



ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux decharges statiques (ESD).
Leur longévité pourrait être considérablement ecourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de securité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della prù grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA.

Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne.

CLASS 1
LASER PRODUCT

(GB) Warning !
Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !
Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !
Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

IMPORTANT
PLEASE NOTE THAT THE VOLTAGE SELECTOR LOCATED AT THE REAR OF THIS SYSTEM IS PRESET AT 220V FROM THE FACTORY. FOR COUNTRIES THAT OPERATE AT 110V, PLEASE ADJUST TO 110V BEFORE YOU SWITCH ON THE SYSTEM.

General Information

- ***The type plate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***

Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

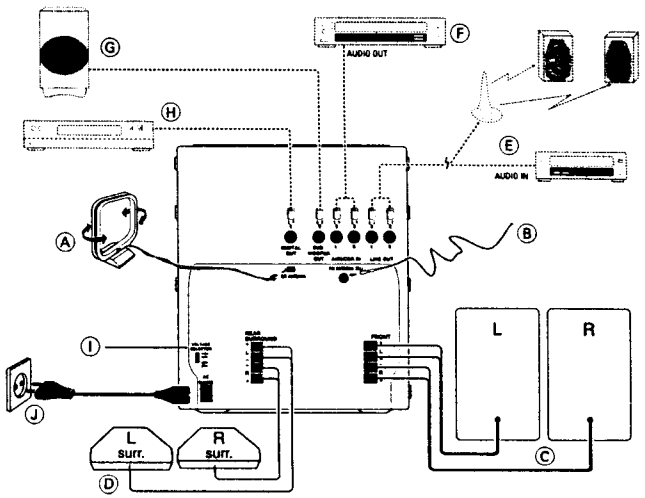
Accessories *(Supplied)*

- Remote control
- Batteries (two AA size) for remote control
- AM loop antenna
- FM wire antenna
- AC power cord
- SS-107 surround speakers

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system. Allow at least 10cm clearance from the rear and the top of the unit and 5cm from the each side.
- The system incorporates a built-in safety feature that prevents overheating.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- ***To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.***

Rear Connections



Ⓐ AM Loop Antenna Connection

Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

Ⓑ FM Wire Antenna Connection

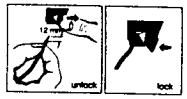
Connect the supplied FM wire antenna to the FM ANTENNA 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

For better FM stereo reception connect an outdoor FM antenna to the FM ANTENNA 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speakers Connection

- Connect the right speaker to Front terminal R with the colored wire to + and the black wire to —
- Connect the left speaker to Front terminal L with the colored wire to + and the black wire to —
- Clip the stripped portion of the speaker wire as shown.



Ⓓ Rear Surround Speakers' Connection

Connect the black (non-marked) wires to the black REAR SURROUND terminals and the colored (marked) wires to the grey REAR SURROUND terminals.

Ⓔ Line Out Connection *(wireless ready)*

You can connect the audio left and right LINE OUT terminals to a optional CD Recorder ANALOGUE IN terminals. This allows you to record in an analogue format.

You can also install additional optional front active speakers away from the system (e.g. in another room) to reduce the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT terminals. Place the active speakers at your preferred location. Be sure to follow the instructions supplied with the active speakers.

Note:

– *Availability of wireless transmitter and its peripherals are subjected to the approval of local authorities. Please check with respective local safety or approving authority.*

Ⓕ Connecting other equipment to your system

You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD Recorder to the AUX/CDR IN terminals at the rear of the system.

Ⓖ Subwoofer Out Connection

Connect the optional active subwoofer to the SUBWOOFER OUT terminal. The subwoofer reproduces just the low bass sound effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

Ⓗ Digital Out Connection

You can record the digital sound from the CD, through this output, on any audio equipment with digital input (e.g. CD Recorder, Digital Audio Tape (DAT) deck, Digital to Analog Converter and Digital Signal Processor).

Connect one end of the cinch cable (not supplied) to the DIGITAL OUT socket and the other end to the audio equipment with digital input. When connecting the cinch cable, make sure it is fully inserted.

Ⓘ Adjusting the Operating Voltage *(not available for all versions)*

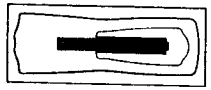
Before connecting the AC power cord to a wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Ⓙ AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.

Controls on the system and remote control

1 **STANDBY ON**
– to switch the system on or to standby mode.
– to use for EASY SET.

2 **DIGITAL SOUND CONTROL (DSC)**
– to select the desired sound effect : OPTIMAL, CLASSIC, TECHNO, JAZZ, ROCK or VOCAL.

3 **INCREDIBLE SURROUND**
– to switch on or off the surround sound effect.

4 🎧
– to connect headphones.

5 **REC (RECORD)**
– to start recording on tape deck 2.

6 **DUB (HIGH SPEED DUBBING (HSD))**
– to dub a tape in normal or fast speed.

7 **JOG**
– to select the desired equalizer display.
– to select the desired DSC setting. You must select the DSC feature first.
– to select the desired level of Incredible Surround Sound. You must select the Incredible Surround Sound feature first.

8 **PROG (PROGRAM)**
for CD ..... to program CD tracks.
for TUNER ..... to program preset radio stations.
for CLOCK ..... to select 12 or 24 hour in clock setting mode *(on the system only)*.

9 **CLOCK/TIMER**
– to view the clock, set the clock or set the timer.

10 **DISPLAY SCREEN**
– to view the current setting of the system.

11 **CD CAROUSEL TRAY**

12 **DISC 1 / DISC 2 / DISC 3 (CD DIRECT PLAY)**
– to select a CD tray for playback.

13 **DISC CHANGE**
– to change CD(s).

14 **OPEN•CLOSE**
– to open or close the CD carousel tray.

15 **SOURCE** – to select the following:
CD / (CD 1•2•3)
– to select CD mode. When CD playback is stopped, press to select disc tray 1, 2 or 3.
TUNER / (BAND)
– to select Tuner mode. When in tuner mode, press to select the waveband FM or MW.
TAPE / (TAPE 1• 2)
– to select Tape mode. When tape playback is stopped, press to select either tape deck 1 or 2.
AUX / (CDR/VIDEO)
– to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder). When in Aux mode, press to select either AUX or CDR.

16 **A. REV (AUTO REVERSE)**
– available in tape deck 2 only.
– to select the desired play modes (⇄ / ⇉ / ⟳).

17 **MODE SELECTION**
SEARCH ◀◀ ▶▶ (TUNING ◀◀ ▶▶)
for CD ..... to search backward/forward.
for TUNER ..... to tune to a lower or higher radio frequency.
for TAPE ..... to rewind or fast forward a tape.
for CLOCK ..... to set the hour *(on the system only)*.
STOP•CLEAR ■
for CD ..... to stop CD playback or to clear a program.
for TUNER ..... to stop programming.
for TAPE ..... to stop playback or recording.
for DEMO ..... *(on the system only)* to start or stop demonstration mode.
PLAY ▶ / PAUSE ❚❚
for CD ..... to start or interrupt playback.
for TAPE ..... to start playback.

⏮ PREV / SIDE / NEXT ⏭ (PRESET ▼▲)
for CD ..... to skip to the beginning of the current, previous, or next track.
for TUNER ..... to select a preset radio station in memory.
for TAPE ..... to select tape side (back or front) in tape deck 2 only.
for CLOCK ..... to set the minute *(on the system only)*.

18 **MIC LEVEL**
– to adjust the mixing level for karaoke or microphone recording.

19 **MIC**
– to connect microphone jack.

20 **VOLUME**
– to increase or decrease the volume.

21 **DYNAMIC BASS BOOST (DBB)**
– to select a bass boost level or to switch off bass boost.

22 **OPEN**
– to open tape deck 2.

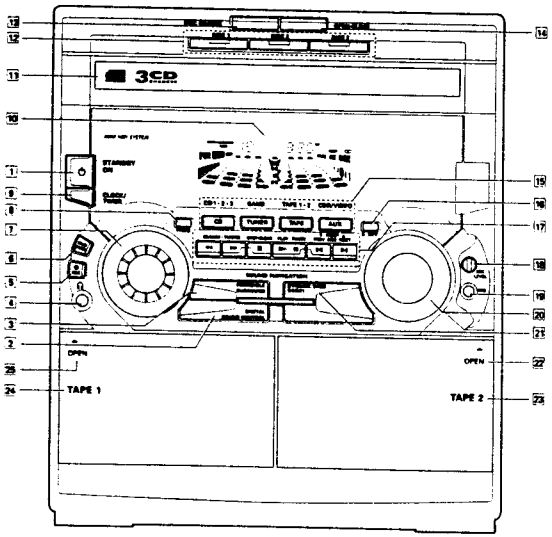
23 **TAPE DECK 2**

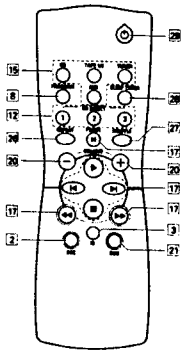
24 **TAPE DECK 1**

25 **OPEN**
– to open tape deck 1.

26 **REPEAT**
– to repeat a CD track, a disc, or all available discs.

27 **SHUFFLE**
– to play all the available discs and their tracks in random order.



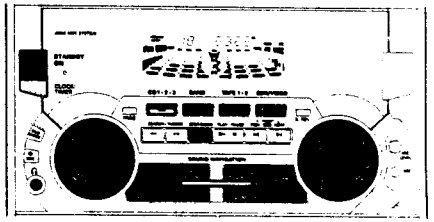


26 **SLEEP TIMER**
– to switch the system to standby mode at a selected time.

27 ⏻
– to switch the system to standby mode.

Notes for remote control:

– ***First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, etc.).***
– ***Then select the desired function (▶, ⏮, ⏭, etc.).***



Important:
Before you operate the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***When the system is switched on for the first time, the demonstration mode will start automatically.***

Notes:

– *During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).*
– *When the system is switched to standby mode, the demonstration will resume 5 seconds later.*

To stop the demonstration mode

- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in demonstration mode.
  → The demonstration will stop.
  → 'DEMO OFF' is displayed.
  → The system will switch to standby mode.

Notes:

– *When the system is switched on from the main power outlet, the CD carousel tray may open and close again to initialize the set.*
– *Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.*

To start the demonstration mode

- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in standby mode.
  → The demonstration will begin.

Easy Set

EASY SET allows you to store all available radio stations automatically.

- Press and hold **STANDBY ON** *(on the system only)* for ***5 seconds*** when the system is in standby or demonstration mode.
  → "EASY SET" will be displayed and followed by "TUNER" and then "AUTO".
  – EASY SET will start searching for all radio on FM band and then followed by radio stations on MW band.
  – All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.

Notes

- *EASY SET will start with the FM band, if there are still presets available, the system will continue to store the MW band.*
- *When EASY SET is used, all previously stored radio stations will be replaced.*
- *The last preset radio station will appear on the display when EASY SET is completed.*

Switching the system ON

- Press **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY ON** or ⏻ on the remote control.
  → The system will switch to standby mode.

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX**.
  → The display indicates the selected source.

Note

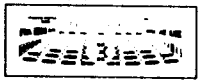
- *For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX/CDR IN terminals.*

Selecting the Equalizer Display

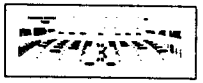
You can select the desired equalizer display for the system. You must not press the DSC or INCREDIBLE SURROUND button on the system before using the JOG control.

- Adjust the JOG control to select the desired Equalizer Display: NORMAL, TOP DOWN, or NITE MODE.
  → The selected display will be shown.

NORMAL Display



TOP DOWN Display



NITE MODE Display

Note

- *In NITE MODE, all lights will be switched off and the display brightness will be dimmed.*

Sound Control

VOLUME ADJUSTMENT

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

INCREDIBLE SURROUND

Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect. There are 12 different Incredible Surround levels available for selection.

- Press **INCREDIBLE SURROUND** to switch on.
  → The INCREDIBLE SURROUND display lights up.
  → "IS XX" will be displayed.

Note

- *"XX" is the last selected Incredible Surround level.*

You can change the Incredible Surround level with the JOG.

- Adjust the JOG control to select the desired Incredible Surround level immediately after selecting the Incredible Surround feature.
  → The Incredible Surround level will increase or decrease between level 1 and 12.

To switch off Incredible Surround

- Press **INCREDIBLE SURROUND** again.
  → The INCREDIBLE SURROUND display is switched off.
  → "IS OFF" will be displayed.

DIGITAL SOUND CONTROL (DSC)

The DSC feature enables you to adjust the system to suit your type of music.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, CLASSIC, TECHNO, JAZZ, ROCK or VOCAL.
  → The selected digital sound is encircled.
  → "OPTIMAL X, CLASSIC, TECHNO X, JAZZ X, ROCK X or VOCAL X" will be displayed. "X" is the pre-selected level.

With the JOG control, you can change the level of any DSC setting except CLASSIC.

- First select the DSC feature, then adjust the JOG control until the desired digital sound setting level is reached.
  → The digital sound setting level will increase or decrease between level 1 and 5.

Note

- *For neutral setting, select CLASSIC and switch off DBB.*

DYNAMIC BASS BOOST (DBB)

There are three DBB settings to enhance the bass response.

- Press **DBB** briefly to select a bass boost level.
  → The respective DBB level will be encircled and lit.
  → "BEAT", "PUNCH" or "BLAST" will be displayed.

To switch off DBB

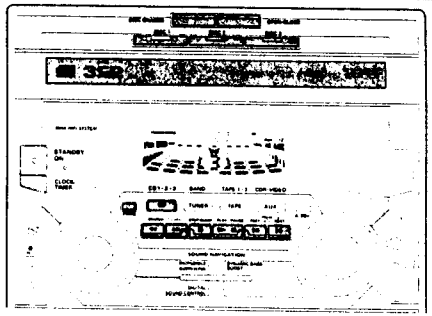
- Press **DBB** briefly until "DBB OFF" is displayed.

Note

- *Some CDs or tapes might be recorded in high modulation, which causes a distortion at high volume. If this occurs, switch off DBB or reduce the volume.*

Automatic DSC-DBB selection

The best DBB setting is generated automatically for each DSC selection. You can manually select the DBB setting that best suits your listening environment.



Warning!

1) This system is designed for conventional CDs. Do not use any accessories such as disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.
2) Do not load more than one disc into each tray.
3) When the CD changer is loaded with CDs, do not turn over or shake the system. This may jam the changer.

You may load three discs in the CD changer for continuous playback without interruption.

Discs for playback

This system can play all digital audio CD, finalized digital audio CD-Recordable and finalized digital audio CD-Rewritable format discs.

Loading the CD Changer

1 Press **CD** to select CD mode.
2 Press **OPEN•CLOSE**.
  → The CD carousel tray slides out.
3 Load a CD with the printed side up in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press the **DISC CHANGE** button.
  → The CD carousel will rotate until the empty tray is ready for loading.

4 Press **OPEN•CLOSE** to close the CD carousel tray.
  → The total number of tracks and the playing time of the selected disc appear on the display.

Note:

- *To ensure good system performance, wait until the CD changer completely reads the disc(s) before proceeding.*

CD Direct Play

- You can play a CD directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.
  → A lit button indicates that a disc is loaded in the disc tray.

Playing a CD

1 Press ▶ to start playback.
  → The disc tray, track number and elapsed playing time of the current track appear on the display.
- To interrupt playback, press ⏸.
  → The playing time flashes.
- To resume playback, press ▶ again.

2 To stop playback, press ■.

Note:

- *All the available discs will play once, then stop.*

Disc Change

You can change the outer two discs while the third inner disc is stopped or is playing.

1 Press **DISC CHANGE**.
  → The CD carousel tray slides out.
2 Replace the discs in the left and right disc trays.
- If you wish to change the inner disc during playback, press **DISC CHANGE** again.
  → "DISC CHANGE" will be displayed.
  → The CD will stop playing.
  → The CD carousel tray will close to retrieve the inner CD and then open again with the inner CD accessible.

3 Press **OPEN•CLOSE** to close the CD carousel tray.

Selecting a desired track

Selecting a desired track when playback is stopped

1 Press ⏮ or ⏭ until the desired track appears on the display.
2 Press ▶ to start playback.
  → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

- Press ⏮ or ⏭ until the desired track appears on the display.
  → The selected track number and elapsed playing time appear on the display.
- If you press ⏮ once it will skip to the beginning of the current track and play the track again.

Note:

- *Pressing ⏮ during shuffling can only skip to the beginning of the current track.*

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible when playback is stopped. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "FULL".

1 Load the desired discs in the disc trays.
2 Press **PROG** to start programming.
  → The PROGRAM starts flashing.
  → It will cancel any previously selected repeat mode.
3 Press the **CD** (CD 1•2•3) or **DISC 1/2/3** button to select the disc.
4 Press ⏮ or ⏭ to select the desired track.
5 Press **PROG** to store the track.
- Repeat steps **3** to **5** to store other discs and tracks.

6 Press ■ once to end programming.
  → The total number of tracks programmed and total playing time appear on the display.

Notes:

- *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears on the display instead of the total playing time.*
- *If the system is reading the disc, programming is not possible, "READING" will be displayed and followed by "DISC X". "X" is the current read disc number.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Reviewing the program

Reviewing of the program is possible only when playback is stopped.

- Press ⏮ or ⏭ repeatedly to review the programmed tracks.
- Press ■ once to exit review mode.

Playing the program

1 Press ▶ to start program playback.
  → "PLAY PROGRAM" will be displayed.
  → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track or all programmed tracks will be played repeatedly.
  → "TRACK" or "PROGRAM" will be displayed.
  → The REPEAT and PROGRAM appear on the display.

2 Press ■ to stop program playback.

Notes:
- *If you press any of the CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM display also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.*
- *REPEAT DISC mode will be cancelled when program playback begins.*

Erasing the program *(when playback is stopped)*

- Press ■
  → "PROGRAM CLEARED" will be displayed

Note
- *The program will be erased when the system is disconnected from the power supply or when the CD carousel tray is opened.*

Shuffle *(only on remote control)*

In shuffle mode, the system plays all the available discs and their tracks in random order. Shuffle may be used also when tracks are programmed.

To shuffle all the discs and tracks

1 Press **SHUFFLE**
  → "SHUFFLE" will be displayed.
  → The SHUFFLE, the disc and the track selected at random appear on the display.
- The discs and the tracks will be played in random order until you press ■.
- If you press **REPEAT** during shuffling, the current track or all available discs will be played repeatedly.
  → "TRACK" or "ALL" will be displayed.
  → The REPEAT and SHUFFLE appear on the display.

2 Press **SHUFFLE** again to resume normal playback
  → The SHUFFLE disappears from the display.

Note:
- *REPEAT DISC mode will be cancelled when shuffle is selected.*

Repeat *(only on remote control)*

You can play the current track, a disc or all available discs repeatedly.

1 Press **REPEAT** on the remote control to select the various repeat modes
  → "TRACK", "DISC", "ALL" or "OFF" will be displayed.
  → The REPEAT appears on the display.
- The selected track, selected disc or all available discs will now be played repeatedly until you press ■.

2 Press **REPEAT** until the "OFF" mode is displayed to resume normal playback
  → The REPEAT disappears from the display.

Notes:
- *REPEAT DISC mode is not available during program play or shuffle mode.*
- *You can also repeat shuffling a program.*
  → *"TRACK" or "PROGRAM" will be displayed.*
  → *The REPEAT, PROGRAM and SHUFFLE appear on the display.*

Changing the MW tuning grid *(not available for version /30)*

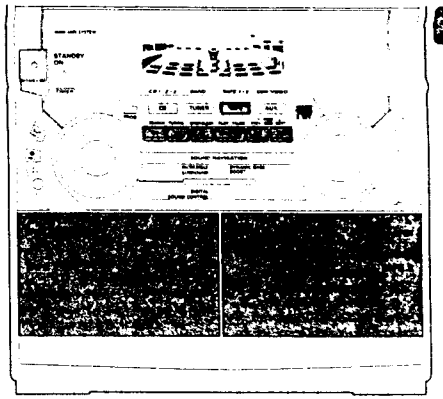
The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step presetted in the factory is 9 kHz.

For MW band
To change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

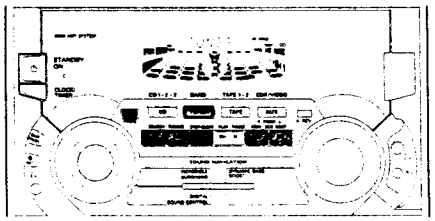
1 Disconnect the system from the AC power supply *(pull out the AC power cord)*.
2 Press **TUNER** and **TUNING** ▶▶ depressed while reconnecting the system to the AC power supply.
  → Display will show "GRID 9" or "GRID 10".

Notes:
- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset radio stations will also be erased.*



Loading a tape

1 Press **OPEN**
2 The tape deck door opens
3 Load the tape with the open side downward and the full spool to the left
4 Close the tape deck door



Note
- *For EASY SET feature, please refer to page 11.*

Tuning to radio stations

1 Press **TUNER** (BAND) to select TUNER mode.
  → "TUNER" will be displayed.
  A few seconds later, the current radio frequency will be displayed.
2 Press **TUNER** (BAND) again to select the desired waveband : FM or MW.
3 Press ◀◀ or ▶▶ for more than one second, then release.
  → The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired radio station is reached.
- To tune to a weak radio station, briefly press ◀◀ or ▶▶ repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1 Press **TUNER** (BAND)
2 Press **PROG** for more than one second.
  → The PROGRAM starts flashing and "AUTO" will be displayed.
  → The system will search for every available radio station in the FM waveband first, then search the MW waveband.
  → All available radio stations will be stored automatically. The frequency and preset number will be displayed briefly.
  → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
  → The system will remain tuned to the last stored preset radio station.

Notes:
- *You can cancel the automatic programming by pressing PROG or ■ (on the system only).*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming, only the preset numbers 10 to 40 will be programmed.*

Manual programming

1 Press **TUNER** (BAND).
2 Press **TUNER** (BAND) again to select the desired waveband : FM or MW.
3 Press **PROG** for less than one second.
  → The PROGRAM starts flashing.
  → The next available preset number will be displayed for selection.
4 Press ◀◀ or ▶▶ to tune to the desired frequency.
- If you wish to store the radio station to another preset number, press ▼ or ▲ to select the desired preset number.

5 Press **PROG** again.
  → The PROGRAM disappears and the radio station will be stored.
- Repeat ***steps 3 – 5*** to store other preset radio stations.

Notes:
- *When 40 radio stations are stored and you attempt to store another radio station, the display will show "FULL". If you want to change an existing preset number, repeat steps 3 – 5.*
- *You can cancel manual programming by pressing ■ (on the system only).*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press ▼ or ▲ to select the desired preset number.
  → The preset number, radio frequency, and waveband appear on the display.

Tape Side *(only on tape deck 2)*

- Press ⏮ or ⏭ to select the tape side for playback or recording.
  → The BACK or FRONT appear on the display, depending on the tape side selected.
  → "T2 <<<" or "T2 >>>" will be displayed.
  → When recording, the BACK or FRONT display will be flashing.

Auto Reverse Playback *(only on tape deck 2)*

- Press **A. REV** to select the different playback modes
  ⇄ ..... to record or playback on one side of the tape. The tape stops at the end of one side.
  ⇉ ..... to record or playback on both sides of the tape. The tape then stops.
  ⟲ ..... to playback continuously on both sides of the tape up to a maximum of 10 times per side unless you press ■.

Tape Playback

1 Press **TAPE** (TAPE 1•2) to select TAPE mode.
  → "TAPE 1" or "TAPE 2" will be displayed, and followed by "T 1" or "T2" with "<<<" or ">>>".
- Press **TAPE** (TAPE 1•2) again to select either tape deck 1 or tape deck 2.

2 Load the tape into the desired tape deck.
3 Press ▶ to start playback.
- If tape 1 is selected for playback;
  → "T 1" with ">" scrolling right will be displayed.
- If tape 2 is selected for playback;
  → "T2" with "<" or ">" scrolling left or right will be displayed depending on the tape side selected.

3a(for playback on tape deck 2 only)
- Press ⏮ or ⏭ to select tape side *(see Tape Side)*.
- Press **A. REV** to select the different type of playback mode *(see Auto Reverse Playback)*.

4 Press ■ to end playback.
  → "T 1" or "T2" with "<<<" or ">>>" will be displayed.

Rewind/Fast Forward

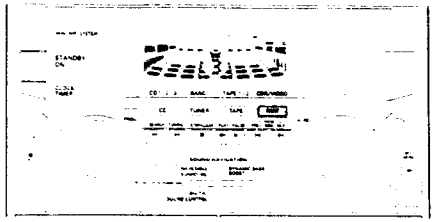
When playback is stopped

1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
  → If rewinding, "T 1 <" or "T2 <" with "<" scrolling left will be displayed.
  → If fast forwarding, "T 1 >" or "T2 >" with ">" scrolling right will be displayed.
  → The tape will stop automatically at the end of the rewinding or fast forwarding.
2 Press ■ to stop rewinding or fast forwarding.

During playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → "T 1" or "T2" with "<<" or ">>" scrolling left or right will be displayed depending on which button is pressed.
  → During searching, the sound is reduced to a low volume.
  → When you release ◀◀ or ▶▶, the tape continues playing.

Notes:
- *During rewinding or fast forwarding of a tape, it is also possible to select another source (e.g. CD, TUNER, or AUX).*
- *Before playing a tape, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.*
- *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
- *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV, or speaker).*

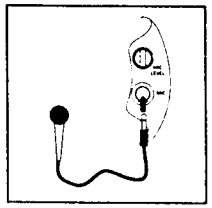


Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player, or CD Recorder) to the AUX/CDR IN terminals, you can hear the enhanced sound from the system.

1 Press **AUX** to select CDR mode.
→ "CDR" will be displayed.
2 Press **AUX** again to select the external (normal AUX) mode.
→ "AUX" will be displayed.

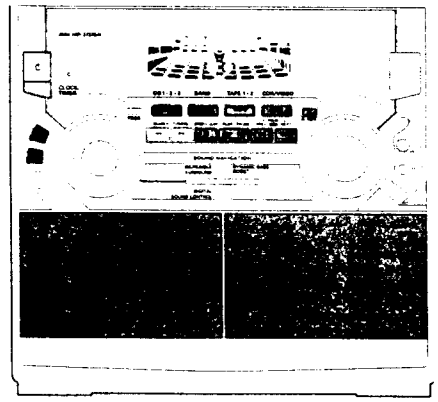
Notes
- *There are two Auxiliary modes*
  - *i the normal AUX mode*
  - *ii the CDR mode, where the LINE OUT of this mini system is muted. You will not be able to record or listen to the sound from the LINE OUT.*
- *You are advised not to listen to and record from the same source simultaneously.*
- *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*



Microphone Mixing

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
2 Connect a microphone to the **MIC** socket.
3 Press **CD**, **TUNER**, **TAPE** or **AUX**.
4 Play the selected source.
5 Adjust the volume level with **VOLUME** control.
6 Adjust the **MIC LEVEL** control to the mixing level that you want.
7 Start singing or talking through the microphone.

Note
- *Keep the mic away from the speakers to prevent howling.*



Notes:
- *It is not possible to change tape side during recording.*
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *For recording, use only tape of IEC type I (normal tape) or IEC type II (CrO_2).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of Volume, DBB, Incredible Surround or DSC.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*
- *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the CrO_2 tape detection hole when covering the tab opening.*

Recording from other sources

(only on tape deck 2)

1 Press **TAPE** (TAPE 1•2) to select tape deck 2.
2 Load a blank tape into tape deck 2 with the open side downward.
3 Press ⏮ or ⏭ to select the recording tape side *(see Tape Side under TAPE section)*.
4 Press **CD**, **TUNER** or **AUX**.
• Start playback of the selected source.
5 Press **REC** to start recording.
→ The ● starts flashing.
6 Press ■ to stop recording.

Notes:
- *Only ⏥ or ⏥ mode is available during recording.*
- *During recording, it is not possible to listen to another source.*

Dubbing tapes *(from tape deck 1 to tape deck 2)*

1 Press **TAPE** (TAPE 1•2) to select tape deck 2.
2 Load the prerecorded tape into tape deck 1 with full spool to the left and a blank tape into tape deck 2 with full spool aside.
3 Press ⏮ or ⏭ to select the recording tape side *(see Tape Side under TAPE section)*.
4 Press **DUB (HSD)** ***once*** for normal speed dubbing or ***twice*** *(within 2 seconds)* for high speed dubbing.
→ "NORMAL" (normal speed) or "FAST" (high speed) will be displayed, followed by "DUB" with "<" or ">" scrolling left or right depending on the tape side selected.
→ The HSD appears on the display during high speed dubbing.
• Dubbing will start immediately.
→ The ● starts flashing.
5 Press ■ to stop dubbing.

Notes:
- *Only ⏥ mode is available during dubbing.*
- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
- *To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*
- *You can listen to another source while dubbing.*

CD Synchro Start Recording

1 Load a blank tape into tape deck 2 and a disc into a disc tray.
2 Press **CD** to select CD mode.
• You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, select the disc by pressing **CD** (CD 1•2•3) and the tracks are recorded according to the order on the selected disc.
3 Press **REC** to start recording.
→ The ● starts flashing.
• CD will start playback automatically.
4 Press ■ to stop recording.

Recording the mixed sound / One Touch Recording

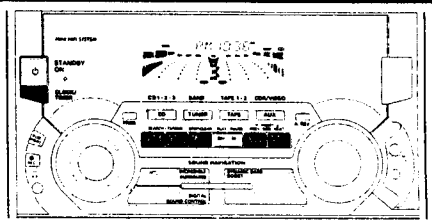
• During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode.
• For One Touch Recording, as soon as you press **REC**, the current source (CD, TUNER or AUX) will be recorded on tape deck 2.

1 Load a blank tape in tape deck 2.
2 Press **REC** to start recording.
→ The ● starts flashing.
3 Press ■ to stop recording.

Note
- *When you press RECORD while in TAPE mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible in TAPE mode.*

Digital Recording via Digital Out

For CD digital recording, please refer to the Instructions Manual of the CD Recorder, digital audio equipment, etc.



View Clock

You can view the clock (if it is set) if the system is in Standby mode or when any sound source is selected (CD, TUNER, etc.). The clock will be displayed for about seven seconds.

• Press **CLOCK/TIMER** briefly.
→ "PM 10:38 or 22:38" (the current time) will be displayed depending on whether you have selected 12- or 24-hour mode.
→ "- - : - -" will be displayed if the clock is not set.

Clock Setting

The clock can be set in either 12- or 24-hour mode, e.g. "AM 12:00" or "00:00". Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK/TIMER** to select clock mode.
2 Press **PROG** *(on the system only)* to select 12- and 24- hour mode.
→ If 12-hour mode is selected, "AM 12:00" starts flashing.
→ If 24-hour mode is selected, "00:00" starts flashing.
3 Set the hour with ⏪ or ⏩ on the system.
4 Set the minute with ⏮ or ⏭ on the system.
5 Press **CLOCK/TIMER** again to store the setting.
→ The clock starts.
• To exit without storing the setting, press ■ on the system.

Notes:
- *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
- *When a power interruption occurs, the clock setting is erased.*

Timer Setting

- The system can switch on to CD, TUNER, or TAPE 2 mode automatically at a preset time. It can serve as an alarm to wake you up.
- Before setting the timer, make sure the clock is set correctly.
- The timer will always be switched on once it is set.
- **The volume of the timer will increase from the minimum level until the volume level before the set is switched to standby mode.**

1 Press and hold **CLOCK/TIMER** for more than ***2 seconds*** to select timer mode.
→ "AM 12:00" or "00:00" or the last timer setting starts flashing depending on whether you have selected 12- or 24-hour mode.
→ The ⏰ starts flashing.
→ The selected source is lit while other available sources are flashing.
2 Press **CD**, **TUNER** or **TAPE** to select the desired source.
• Before selecting CD or TAPE, make sure a CD or tape is loaded in the CD tray or tape deck 2.
3 Press ⏪ or ⏩ on the system to set the hour for the timer to start.
4 Press ⏮ or ⏭ on the system to set the minute for the timer to start.

5 Press **CLOCK/TIMER** to store the start time.
→ The timer is now set.
→ The TIMER remains on the display.
• At the preset time, the timer will be activated.
→ The selected source will be played.

Notes
- *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
- *If the source selected is TUNER, the last tuned frequency will be switched on.*
- *If the source selected is CD, playback will begin with the first track of the selected disc or program. If the CD trays are empty, TUNER will be selected instead.*
- *If the source selected is TAPE, and if the preset time is reached during high speed dubbing, the TUNER will be selected instead.*
- *The timer will not activate if a recording is in progress.*

To switch off the TIMER
1 Press and hold **CLOCK/TIMER** for more than *2 seconds*.
2 Press ■ on the system to cancel the timer.
→ The timer is now switched off.
→ The display will show "OFF" and the TIMER disappears.

To start the TIMER again *(for the same preset time and source)*
1 Press and hold **CLOCK/TIMER** for more than *2 seconds*.
2 Press **CLOCK/TIMER** again to store the start time.
→ The timer is now on.
→ The TIMER appears on the display.

Sleep Timer *(only on remote control)*

This feature allows you to select a length of time after which the system will switch to the standby mode automatically.

1 Press **SLEEP TIMER** on the remote control repeatedly to select a period of time.
→ The selections are as follows (time in minutes):
60 → 45 → 30 → 15 → OFF → 60 ...
→ "SLEEP XX" or "OFF" will be displayed. "XX" is the time in minutes.
2 When you reach the desired length of time, stop pressing the **SLEEP TIMER** button.
→ After this amount of time passes, the system will switch to the standby mode.

To switch off the Sleep Timer
• Press **SLEEP TIMER** repeatedly until "OFF" is displayed, or press the **STANDBY ON** button.

Maintenance

Cleaning the Cabinet
• Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, sprirts, ammonia or abrasives.

Cleaning Discs
• When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.

• Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens
• After prolonged use, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.

Cleaning the Heads and the Tape Paths
• To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
• Use a cotton swab slightly moistened with cleaning fluid or alcohol.
• You can also clean the heads by playing a cleaning tape once.

Demagnetizing the heads
• Use a demagnetizing tape available at your dealer.

Warning! Under no circumstances should you try to repair the set yourself as this will invalidate the guarantee. Do not open the set as there is a risk of electric shock.
• If a fault occurs, check the points listed below before taking the system for repair.
• Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.
• The disc is inserted upside down.
→ *Place CD with printed side up.*
• Moisture condensation at the lens.
→ *Wait until lens has adjusted to normal room temperature.*
• There is no disc in the CD tray.
→ *Insert a CD.*
• The CD is dirty, badly scratched or warped.
→ *Clean or replace the CD.*
• The CD lens is dirty or dusty.
→ *See section under Maintenance (page 25).*

"DISC NOT FINALIZED" is displayed.
• The CD-RW or CD-R disc is not properly recorded for use with a standard CD player.
→ *Read the instruction booklet of your CD-Rewritable or CD-Recorder on how to finalize a recording.*
• The CD is badly scratched or dirty.
→ *Replace or clean CD.*

Radio Reception

Poor radio reception.
• The signal is too weak.
→ *Adjust the antenna.*
→ *Connect an external antenna for better reception.*
• The TV or VCR is too close to the stereo system.
→ *Separate the stereo system from the TV or VCR.*

Cannot tune to station.
• Wrong tuning grid.
→ *Switch to the correct tuning grid.*

Tape Deck Operation

Recording or playback cannot be made or there is a decrease in audio level.
• Dirty tape heads, capstans or pressure rollers.
→ *See section on tape deck maintenance (page 25).*
• Magnetic build-up in the record/playback head.
→ *Use demagnetizing tape.*

Tape deck door cannot open.
• Power failure or AC power plug disconnect from the wall outlet during tape playback.
→ *Reconnect the AC power plug and switch on the system again.*

General

System does not react when any button is pressed.
• Electrostatic discharge.
→ *Press STANDBY ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect the power plug and switch on the system again.*

No or poor sound.
• Volume is not turned up.
→ *Adjust VOLUME.*
• The headphones are connected.
→ *Disconnect the headphones.*
• Speakers are not connected or are connected wrongly.
→ *Check that the speakers are connected correctly.*
→ *Make sure the stripped speaker wire is clamped.*

Reversed left and right sound.
• Speakers are connected wrongly.
→ *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.
• Speakers are connected wrongly.
→ *Check the speaker connection for proper phasing, colored/black wires to colored/black terminals.*

Remote control has no effect on the system.
• Wrong source is selected.
→ *Select the source (CD, TUNER, etc.) before pressing the function button (▶, ⏮, ⏭, etc.).*
• The distance to the system is too large.
→ *Reduce the distance.*
• Batteries are inserted incorrectly.
→ *Insert the batteries with their polarities (+/– signs) as indicated.*
• Batteries are exhausted.
→ *Replace the batteries.*

Timer is not working.
• Clock is not set.
→ *Set the clock.*
• Timer is not switched on.
→ *Press CLOCK/TIMER to switch on the timer.*
• Recording is in progress.
→ *Stop recording.*

Clock setting is erased.
• There was a power failure.
→ *Reset the clock.*

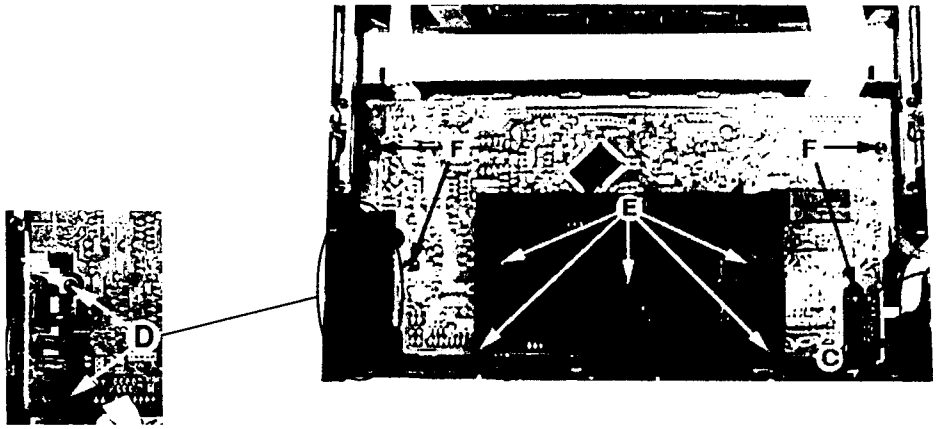
System displays features automatically; buttons flash continuously.
• Demonstration mode is switched on.
→ *Press and hold ■ (on the system) for 5 seconds to switch off the demonstration.*

There is a howling sound at the external source.
• You hear feedback when you are listening from the same source simultaneously.
→ *Press AUX to select CDR mode.*

All lighted buttons are not lit.
• Equalizer Display is switched on in NITE mode.
→ *Adjust JOG to select other Equalizer Display.*

Dismantling of the Front Board

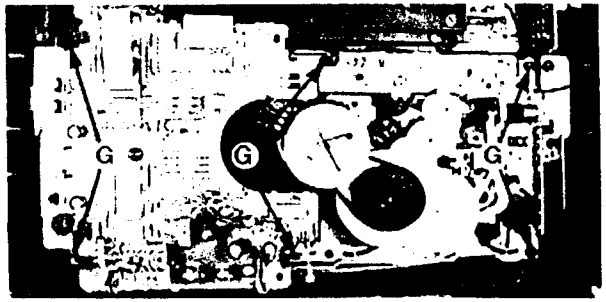
1) Remove 1 screw C as indicated to loosen the Headphone Board (pos 1101-A).
2) Remove 2 screws D as indicated to loosen the Karaoke Board (pos 1102-C) for set with Karaoke.
3) Remove 5 screws E as indicated to loosen the Plate Front (pos 254).
4) Remove 4 screws F as indicated to loosen the Front Board (pos 1102-A).



Remove Karaoke Board

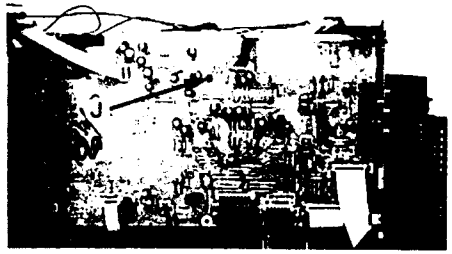
Dismantling of the ETF Tape Module

1) Remove 6 screws G as indicated to loosen the ETF Tape Module (pos 1105).

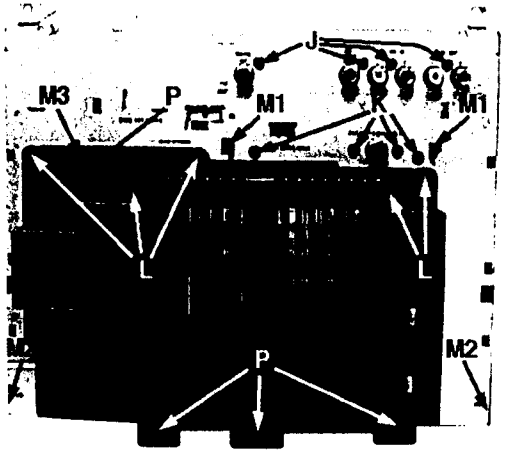


Dismantling of Rear Portion

1) Remove 5 screws J as indicated to loosen the AF Board (pos 1101-B).
2) Remove 4 screws K and uncatch M1 as indicated to loosen the Tuner Board (pos 1100).
3) Remove 5 screws L and uncatch M2 as indicated to take out the Plate Rear(pos 229).
4) Remove 4 screws P and uncatch M3 as indicated to free the Power Module (pos 1103) from the Bottom Plate assembly.



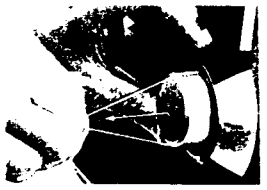
AF Board Top View



Repair Hints

1) The Knob Volume Rotary (pos 140) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 1.

Picture 1



2) The Jog Rotary (pos 142) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 2.

Picture 2

3) During re-assembly of the Power Module, place the Bracket Mains Socket (pos 232) behind the Mains Socket and catch it onto the Rucksack (pos 1103-201) of the Power Module. See pictures 3 and 4.

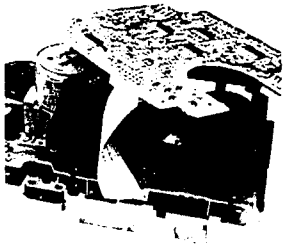
4) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

5) Due to the short flex cable wires in the ETF Module, the pc board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 5.

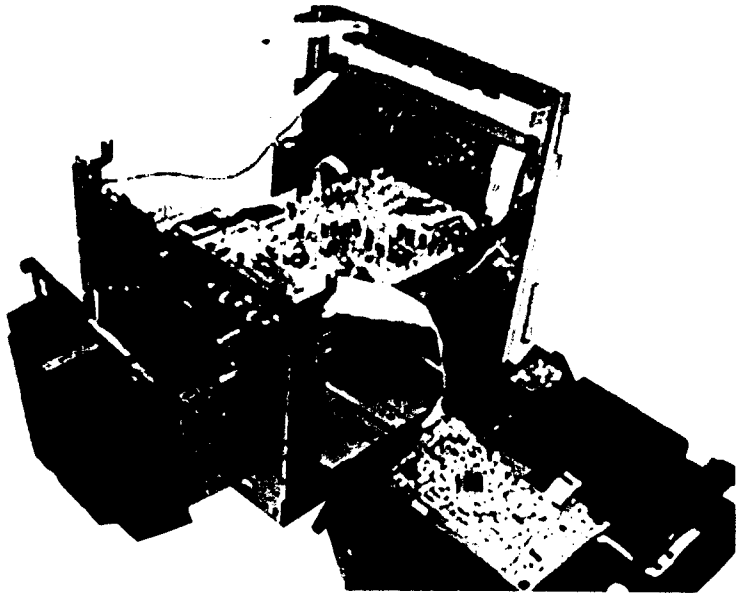
Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

Picture 3 Picture 4

Picture 5



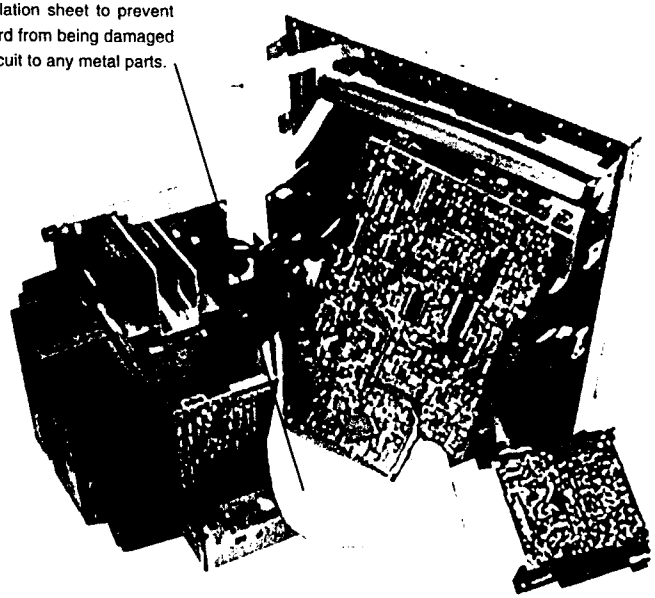
Service pos A



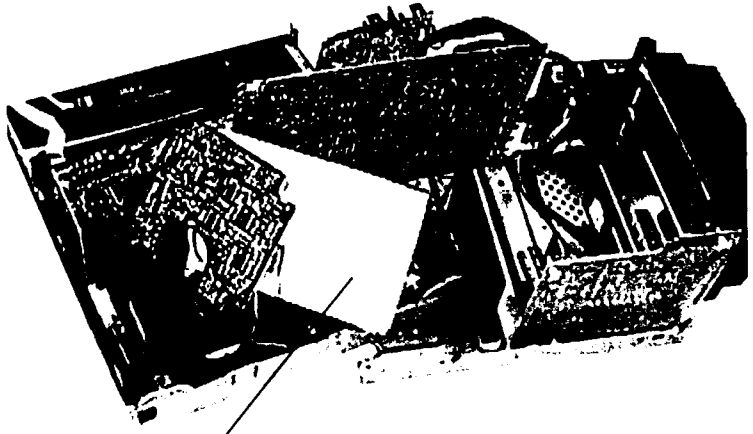
3-3

Service pos B

Use a insulation sheet to prevent the AF board from being damaged or short-circuit to any metal parts.



Service pos C



Use a insulation sheet to prevent the ETF board from being damaged or short-circuit to any metal parts.

3-4

SERVICE TEST PROGRAM

To start service test program hold ⏭ & Aux depressed while plugging in the mains cord

Display shows the ROM version "S-Vyy" (Main menu)

S refers to Service Mode

V refers to Version

yy refers to Software version number of the µProcessor (counting up from 01 to 99)

TUNER TEST

TUNER Button pressed? N

Y

Display Tuner Version "ccc"

TUNER Button pressed? N

Service frequencies are copied to the RAM (see Table 1) Tuner works normally except:

PROGRAM button

Disconnect Mains cord ? N

Y

Service Mode left

QUARTZ TEST

⏮ Button pressed? N

Y

Display shows 32K Output at (Front Board) pin 80 of uP = 2048Hz

⏮ Button pressed? N

Y

Display shows 8M Output at (Front Board) pin 80 of uP = 1,953.125Hz

■ Button pressed? N

Y

Caution : When in Service Mode, wait for a few seconds before activating Quartz Test to ensure correct CD behaviour.

SERVICE PLAY MODE

POWER Button pressed? N

Y

Set is in Service PLAY Mode.

In case of failures, error codes according to Table 2 will be displayed.

The Service Play Mode is intended to detect and identify the failures in the CD Mode.

In this mode the electronics will still function even when an error is detected so that repair activities can be carried out.

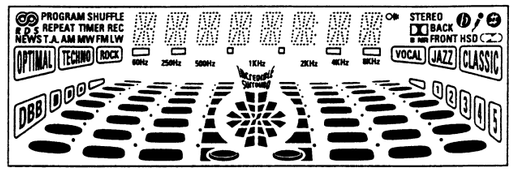
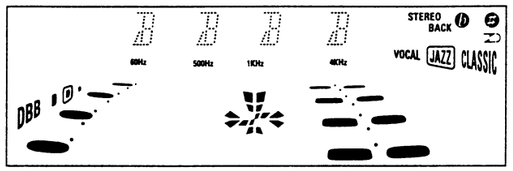


Figure 1



note1 : DISC1, DISC3, CD, TAPE, Stereo Right, DPL Surround Left, DPL Centre Left.

Figure 2

DISPLAY TEST

▶ Button pressed? N

Y

Display shows Figure 1 and switch all LEDs on

▶ Button pressed? N

Y

Display shows Figure 2 and switch alternate LEDs on (see note1)

■ Button pressed? N

Y

Various other Tests

PRESET	Europe "EUR"	East Eur. "EAS"	East Eur. Extended-band "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	87.5MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	531kHz	74MHz	530kHz	531/530kHz*
4	1602kHz	1602kHz	87.5MHz	1700kHz	1602/1700kHz*
5	558kHz	558kHz	531kHz	560kHz	558/560kHz*
6	1494kHz	1494kHz	1602kHz	1500kHz	1494/1500kHz*
7	153kHz	87.5MHz	558kHz	98MHz	87.5MHz
8	279kHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	198kHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	98MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	87.5MHz	98MHz	65.81MHz	87.5MHz	98MHz

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and ▶▶ buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

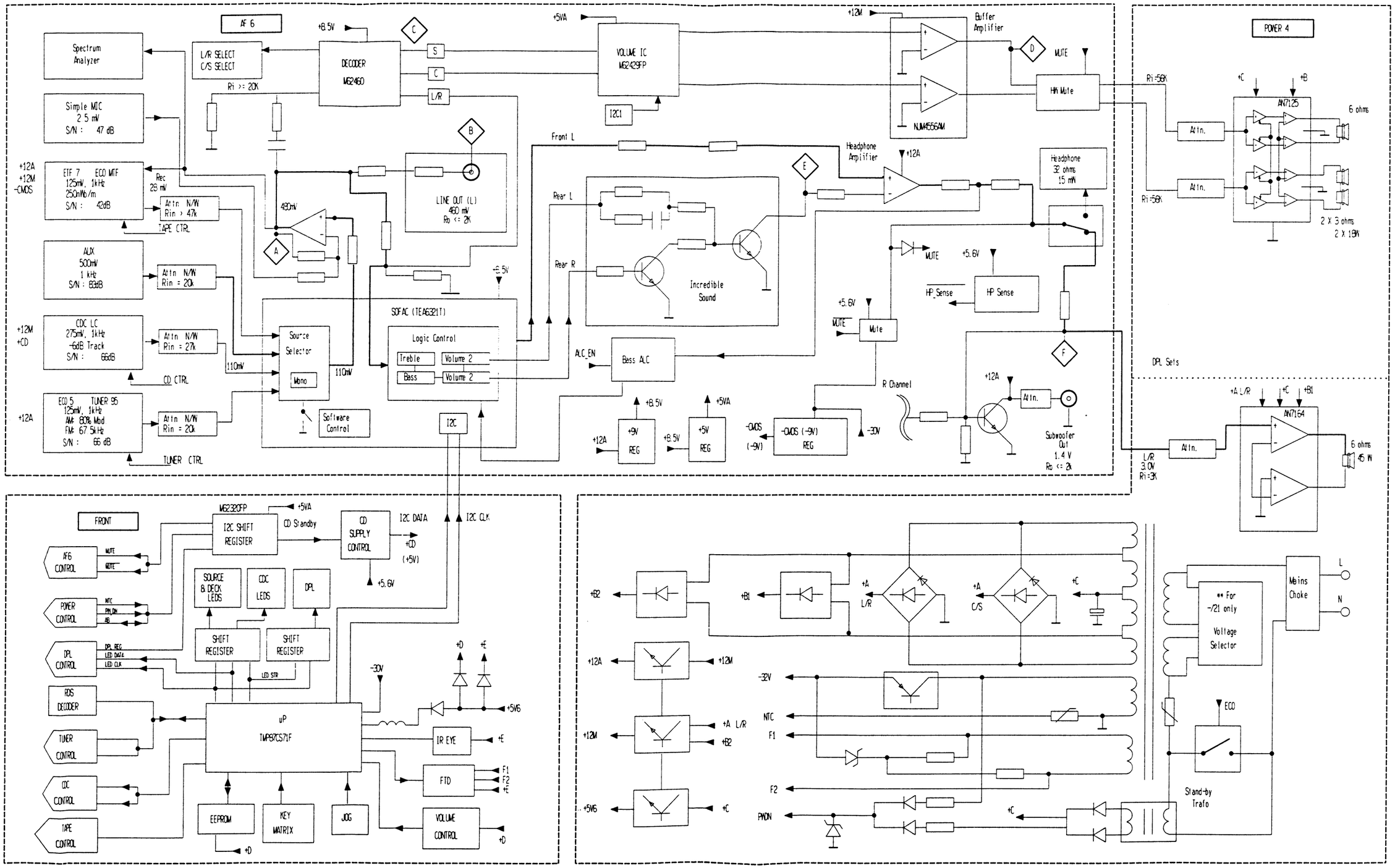
Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1070	The carousel switch is not open within certain time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.

Table 2

TEST	*Activated with*	*ACTION*
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
ENCODER TEST	Volume Knob or Jog Shuttle Knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

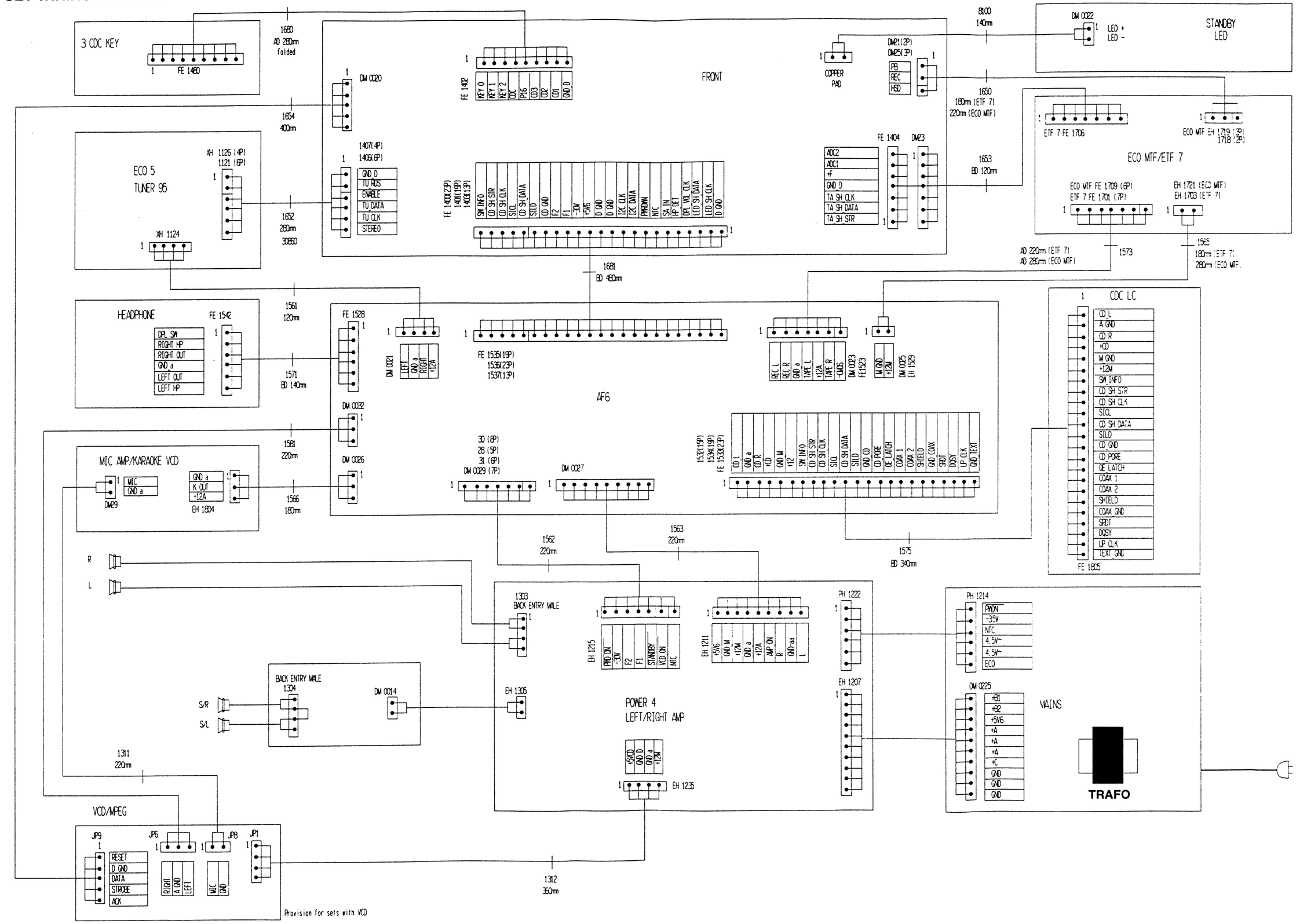
4-1

SET BLOCK DIAGRAM



5-1

SET WIRING DIAGRAM



FRONT BOARD

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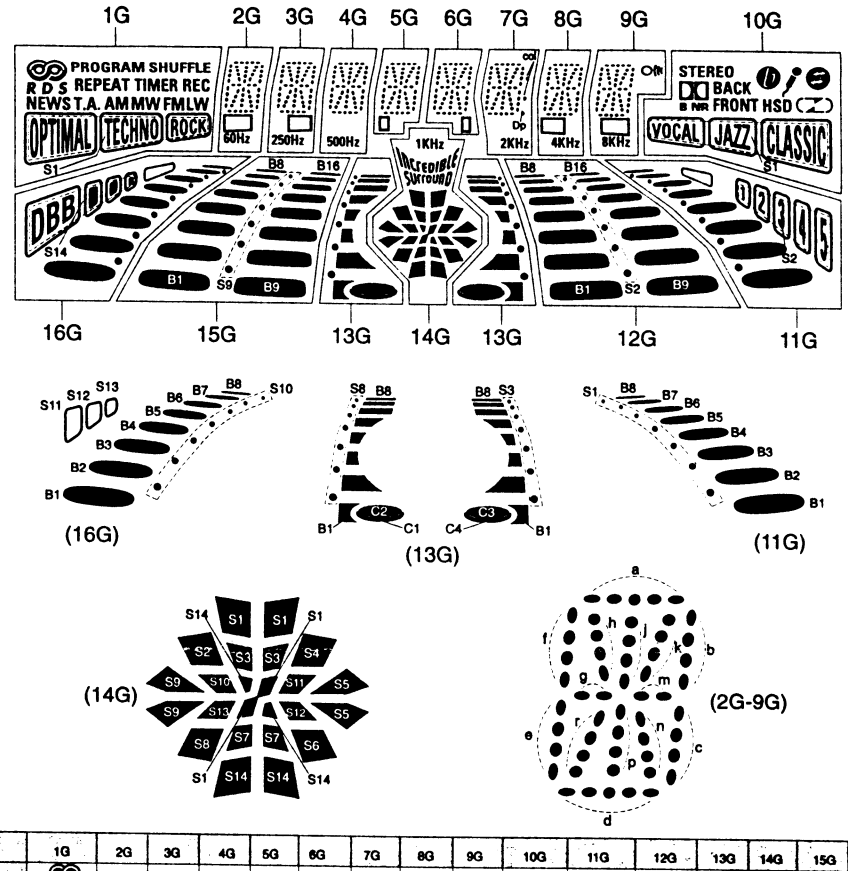
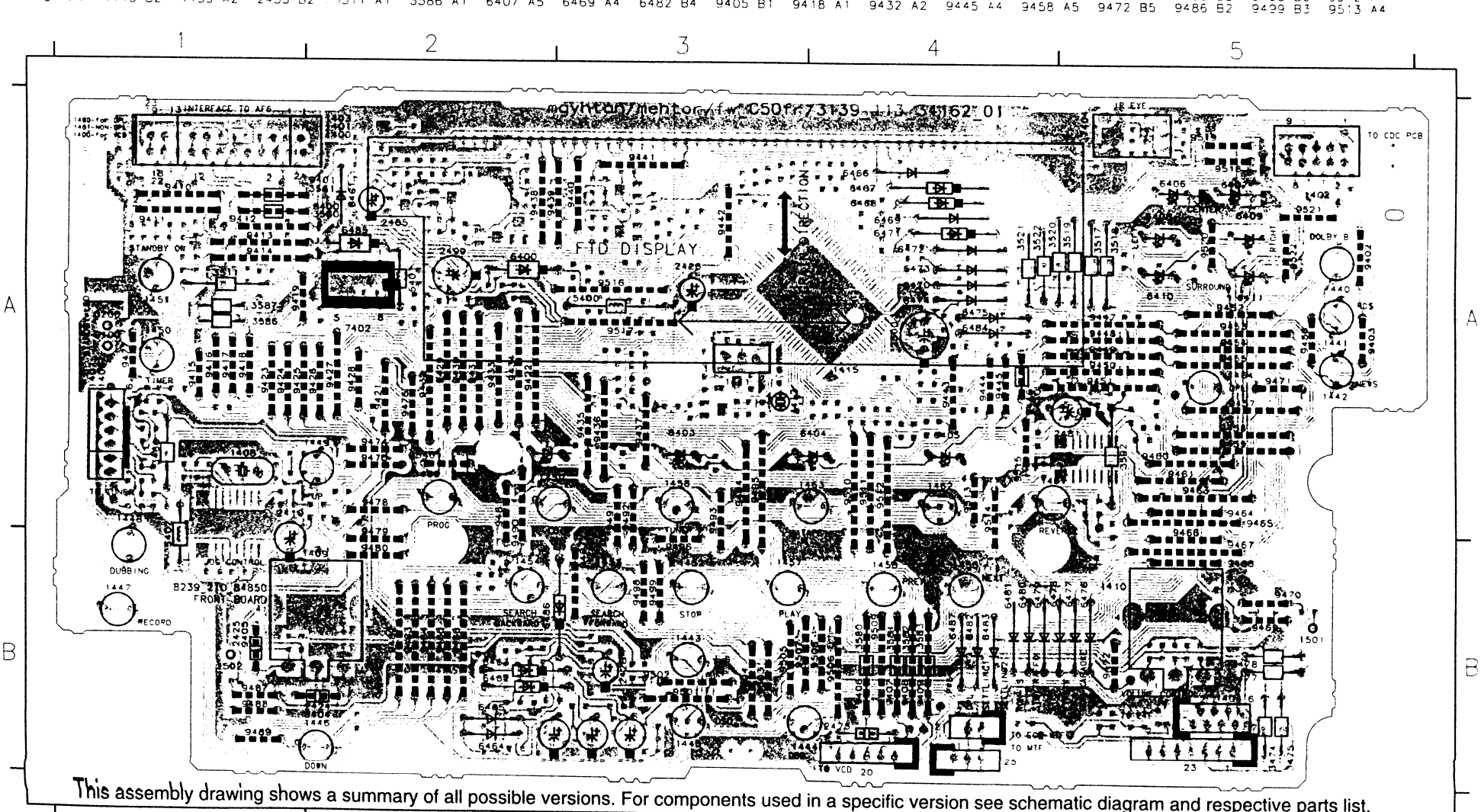
FTD DISPLAY PIN CONNECTIONS



	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G	15G	16G
P1	RDS	a	a	a	a	a	a	a	a	STEREO	B1	B1 , B9	B1	S1	B1 , B9	B1
P2	NEWS	h	h	h	h	h	h	h	h	NR	B2	B2	B2	S2	B2	B2
P3	T.A.	j,p	j,p	j,p	j,p	j,p	j,p	j,p	j,p	BACK	B3	B3	B3	S3	B3	B3
P4	PROGRAM	k	k	k	k	k	k	k	k	FRONT	B4	B4	B4	S4	B4	B4
P5	SHUFFLE	b	b	b	b	b	b	b	b		B5	B5	B5	S5	B5	B5
P6	REPEAT	f	f	f	f	f	f	f	f		B6	B6	B6	S6	B6	B6
P7	TIMER	m	m	m	m	m	m	m	m		B7	B7	B7	S7	B7	B7
P8	REC	g	g	g	g	g	g	g	g	HSD	B8	B8	B8	S8	B8	B8
P9	AM	c	c	c	c	c	c	c	c		S1	S2	S3	S9	S9	S10
P10	MW	e	e	e	e	e	e	e	e			B10	S8	S10	B10	
P11	FM	r	r	r	r	r	r	r	r		S2	B11	-	S11	B11	-
P12	LW	n	n	n	n	n	n	n	n	-		B12	-	S12	B12	
P13	S1	d	d	d	d	d	d	d	d	S1		B13	C1	S13	B13	S14
P14	OPTIMAL			-			col			VOCAL		B14	C2	S14	B14	S11
P15	TECHNO	60Hz	250Hz	500Hz	-	-	2KHz	4KHz	8KHz	JAZZ		B15	C3	1KHz	B15	S12
P16	ROCK	-	-	-	-	-	Dp	-	On	CLASSIC		B16	C4	INCREDIBLE SURROUND	B16	S13

FRONT BOARD - COMPONENT LAYOUT

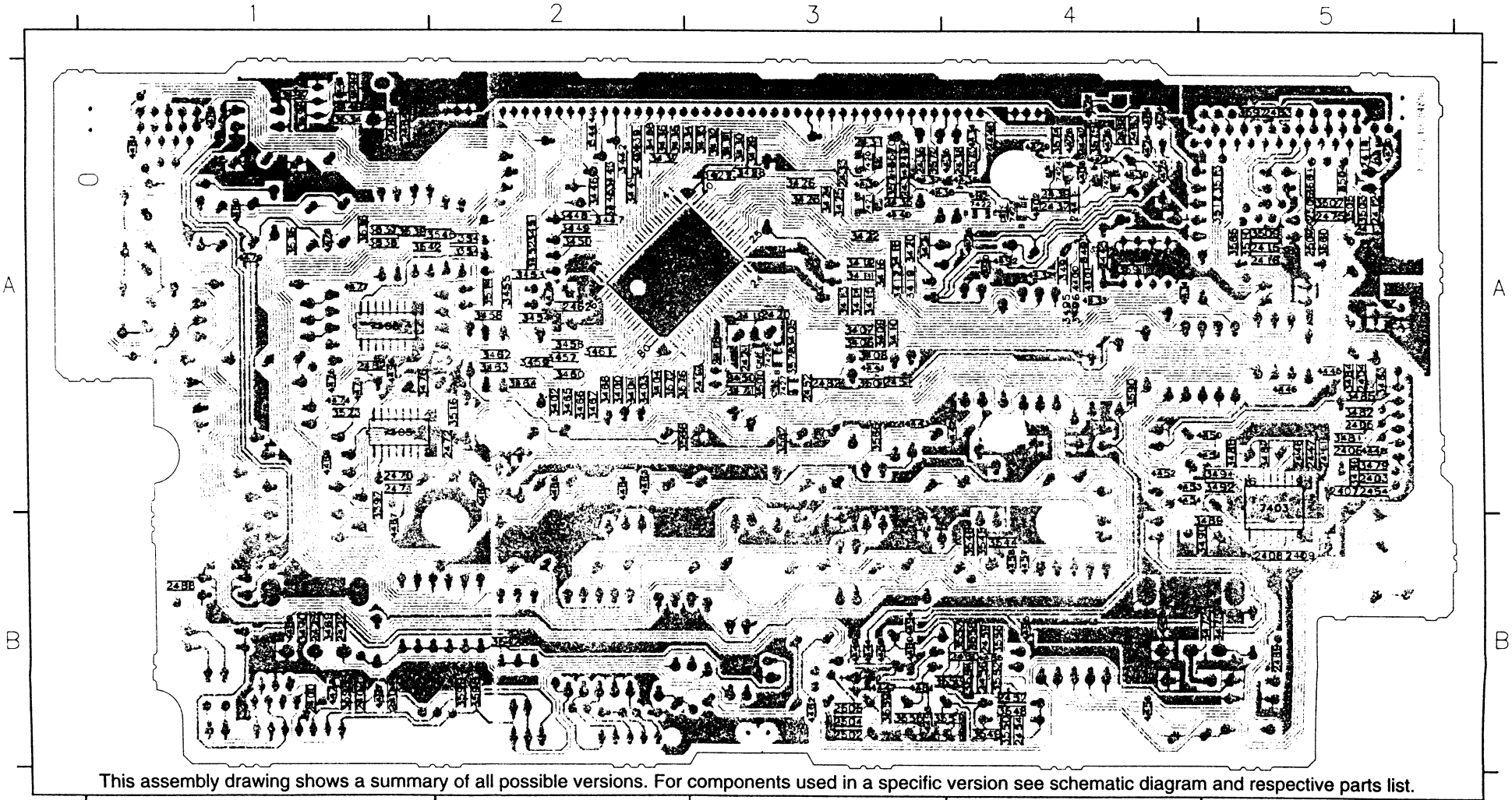
20	B4	1408	A1	1447	B1	1460	A2	2455	B3	3517	A5	3587	A1	6408	A5	6470	A4	6483	B4	9406	B4	9419	A1	9433	A2	9446	A4	9459	A5	9474	A2	9487	B1	9501	B3	9514	A4
21	B4	1409	B2	1448	A1	1461	A4	2458	B3	3518	A5	3592	A5	6409	A5	6471	A4	6484	A4	9407	B4	9421	A2	9434	A2	9447	A5	9460	A5	9475	A2	9488	B1	9502	B3	9515	A4
23	B5	1410	B5	1449	A2	1462	A4	2465	A2	3519	A5	5400	A3	6410	A5	6472	A4	6485	A2	9408	B4	9422	A2	9435	A3	9448	A5	9461	A5	9476	A2	9489	B1	9503	B3	9516	A3
25	B4	1411	A3	1450	A1	1463	A4	2473	B4	3520	A4	5401	A2	6411	A5	6473	A4	6486	B2	9409	B4	9423	A1	9436	A3	9449	A5	9463	A5	9477	A1	9490	B2	9504	B3	9517	A3
0100	A1	1412	A3	1451	A1	1464	A5	2481	A5	3521	A4	5402	B1	6461	A2	6474	A4	6487	B4	9410	A1	9424	A1	9437	A3	9450	A5	9464	A5	9478	A2	9491	A3	9505	B3	9518	A5
0200	A1	1415	A4	1452	B3	1501	B5	2499	A2	3522	A4	5410	A4	6462	B2	6475	A4	7402	A2	9411	A1	9425	A1	9438	A2	9451	A5	9465	A5	9479	B2	9492	A3	9506	B4	9519	A5
1400	A2	1440	A5	1453	B3	1502	B1	2500	A4	3560	A2	6400	A2	6463	B2	6476	B5	7404	A5	9412	A1	9426	A2	9439	A2	9452	A5	9466	A5	9480	B2	9493	A3	9507	B3	9520	A5
1401	A2	1441	A5	1454	B2	2410	A1	3474	B5	3561	A2	6402	A2	6464	B2	6477	B5	9400	A2	9413	A1	9427	A2	9440	A3	9453	A5	9467	B5	9481	A2	9494	A3	9508	B4	9521	A5
1402	A5	1442	A5	1455	B4	2424	B2	3475	B5	3580	B4	6403	A3	6465	B2	6478	B4	9401	A2	9414	A1	9428	A2	9441	A3	9454	A5	9468	B5	9482	B2	9495	A3	9509	B4	9522	A5
1403	A2	1443	B3	1456	B4	2425	B1	3477	B5	3581	B4	6404	A4	6466	A4	6479	B4	9402	A5	9415	A1	9429	A2	9442	A3	9455	A5	9469	B5	9483	B2	9496	B3	9510	A4	9540	A2
1404	B5	1444	B3	1457	B3	2426	A3	3478	B5	3582	B4	6405	A4	6467	A4	6480	B4	9403	A5	9416	A1	9430	A2	9443	A4	9456	A5	9470	B5	9484	B2	9497	B3	9511	A4		
1406	A1	1445	B3	1458	A3	2428	B3	3486	A1	3583	B4	6406	A5	6468	A4	6481	B4	9404	B2	9417	A1	9431	A2	9444	A4	9457	A5	9471	A5	9485	B2	9498	B3	9512	A4		
1407	A1	1446	B2	1459	A2	2453	B2	3511	A1	3586	A1	6407	A5	6469	A4	6482	B4	9405	B1	9418	A1	9432	A2	9445	A4	9458	A5	9472	B5	9486	B2	9499	B3	9513	A4		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CHIP LAYOUT

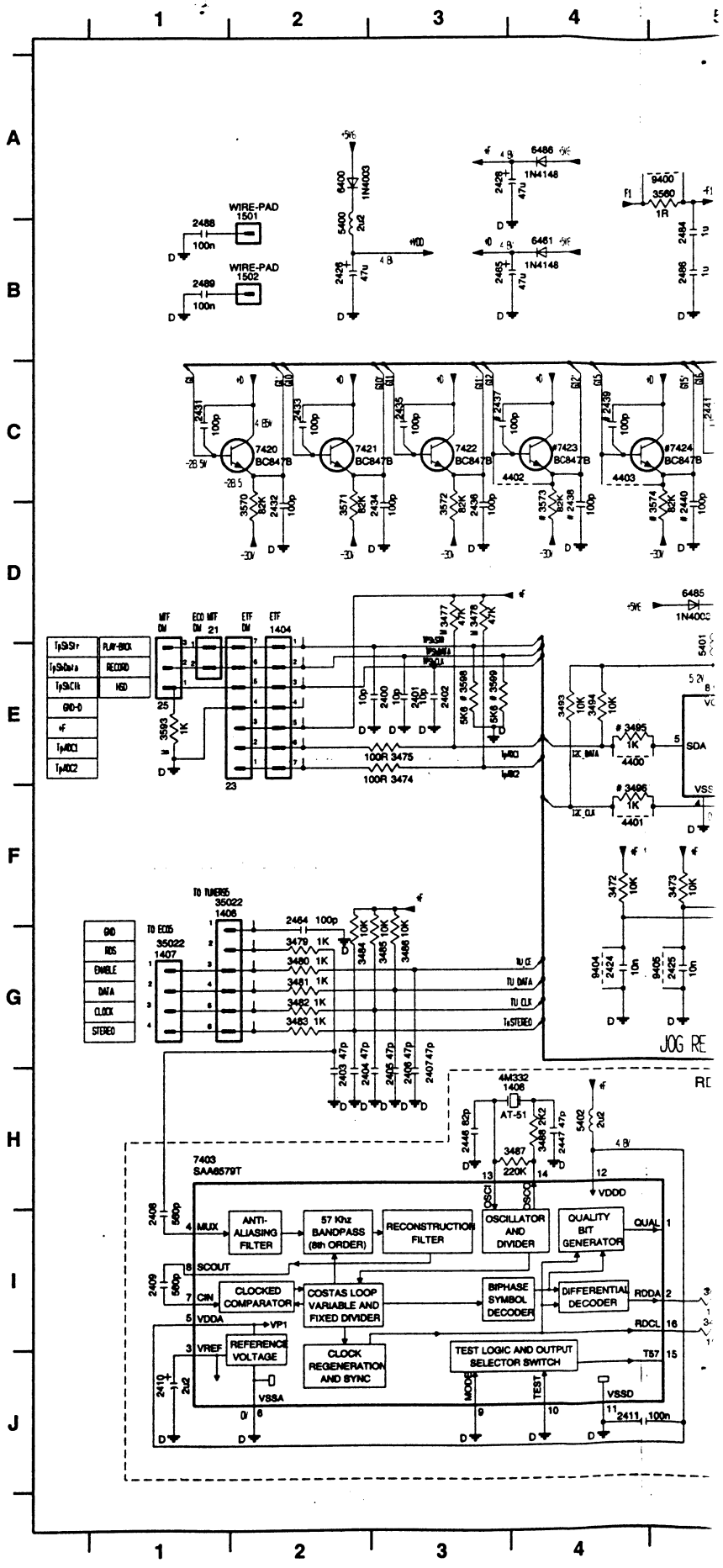
2400 B1	2418 A3	2442 A4	2470 A1	3397 A1	3416 A3	3433 A3	3450 A2	3467 A2	3489 B5	3509 A5	3544 B4	3567 A3	3599 B2	4430 A4	4447 B3	4464 A2	4484 A4	7424 A4
2401 B1	2419 A3	2445 A4	2471 A1	3400 A2	3417 A3	3434 A3	3451 A2	3468 A2	3490 B5	3510 A5	3545 B4	3568 A2	3660 A5	4431 A4	4448 A5	4465 A2	4485 B4	7425 A4
2402 B1	2420 A3	2446 A5	2472 A2	3401 A2	3418 A3	3435 A2	3452 A2	3469 B1	3491 A5	3512 A5	3546 B4	3570 A3	3661 A5	4432 A4	4449 B3	4466 A2	4490 A4	7426 A3
2403 A5	2421 A3	2447 A5	2475 A5	3402 A2	3419 A3	3436 A2	3453 A2	3470 B1	3492 A5	3513 A5	3547 B2	3571 A3	4400 A4	4433 A4	4450 A5	4467 B1	4492 A4	7427 A3
2404 A5	2422 B1	2448 A1	2482 A3	3403 A2	3420 A3	3437 A2	3454 A2	3471 A3	3493 A4	3514 A2	3548 B4	3572 A3	4401 A4	4434 A4	4451 A5	4468 A1	4493 B3	
2405 A5	2423 B1	2449 A1	2483 A4	3404 A2	3421 A3	3438 A2	3455 A2	3472 B5	3494 A4	3516 A2	3549 B4	3573 A4	4402 A4	4435 A4	4452 A4	4469 B1	4494 B3	
2406 A5	2431 A3	2450 A3	2484 A1	3405 A3	3422 A3	3439 A2	3456 A2	3473 B5	3495 A4	3523 A1	3550 B4	3574 A4	4403 A4	4436 A4	4453 A4	4471 A1	4495 B4	
2407 A5	2432 A3	2451 A3	2485 A4	3406 A3	3423 A3	3440 A2	3457 A2	3476 A1	3496 A4	3534 A1	3551 B4	3575 A4	4420 A5	4437 A3	4454 A4	4473 B1	4496 A1	
2408 B5	2433 A3	2452 A3	2486 A1	3407 A3	3424 A3	3441 A2	3458 A2	3479 A5	3497 A1	3535 A1	3552 B4	3576 A2	4421 A4	4438 A4	4455 B4	4474 A1	4497 B1	
2409 B5	2434 A3	2454 B4	2487 A1	3408 A3	3425 A3	3442 A2	3459 A2	3480 A5	3498 A1	3536 A1	3553 B4	3577 A2	4422 A4	4439 A3	4456 B4	4475 A1	7400 A2	
2411 A5	2435 A3	2456 B4	2488 B1	3409 A3	3426 A3	3443 A2	3460 A2	3481 A5	3499 A1	3537 A1	3554 B4	3578 A3	4423 A4	4440 A3	4457 B4	4476 A2	7403 A5	
2412 A5	2436 A3	2457 B4	2489 B5	3410 A3	3427 A3	3444 A2	3461 A2	3482 A5	3500 A3	3538 A1	3555 B3	3585 A5	4424 A4	4441 A3	4458 B4	4477 A1	7405 A1	
2413 A5	2437 A4	2459 B4	2502 B3	3411 A3	3428 A3	3445 A2	3462 A2	3483 A5	3501 A3	3539 A1	3556 B4	3590 A4	4425 A4	4442 A4	4459 B3	4478 A1	7406 A1	
2414 A5	2438 A4	2460 B4	2504 B3	3412 A3	3429 A3	3446 A2	3463 A2	3484 A5	3503 A5	3540 A2	3557 B4	3591 A4	4426 A4	4443 A3	4460 B3	4479 A1	7420 A3	
2415 A5	2439 A4	2462 A2	2505 B3	3413 A3	3430 A3	3447 A2	3464 A2	3485 A5	3504 A5	3541 A2	3558 B4	3593 B1	4427 A4	4444 B3	4461 B3	4480 A1	7421 A3	
2416 A5	2440 A4	2463 A5	2506 A5	3414 A3	3431 A3	3448 A2	3465 A2	3487 A5	3505 A5	3542 A1	3559 B3	3597 A5	4428 A4	4445 A5	4462 B3	4481 A1	7422 A4	
2417 A3	2441 A4	2464 A5	2507 A5	3415 A3	3432 A3	3449 A2	3466 A2	3488 A5	3507 A5	3543 A2	3566 A3	3598 B2	4429 A4	4446 A5	4463 A2	4482 A1	7423 A4	

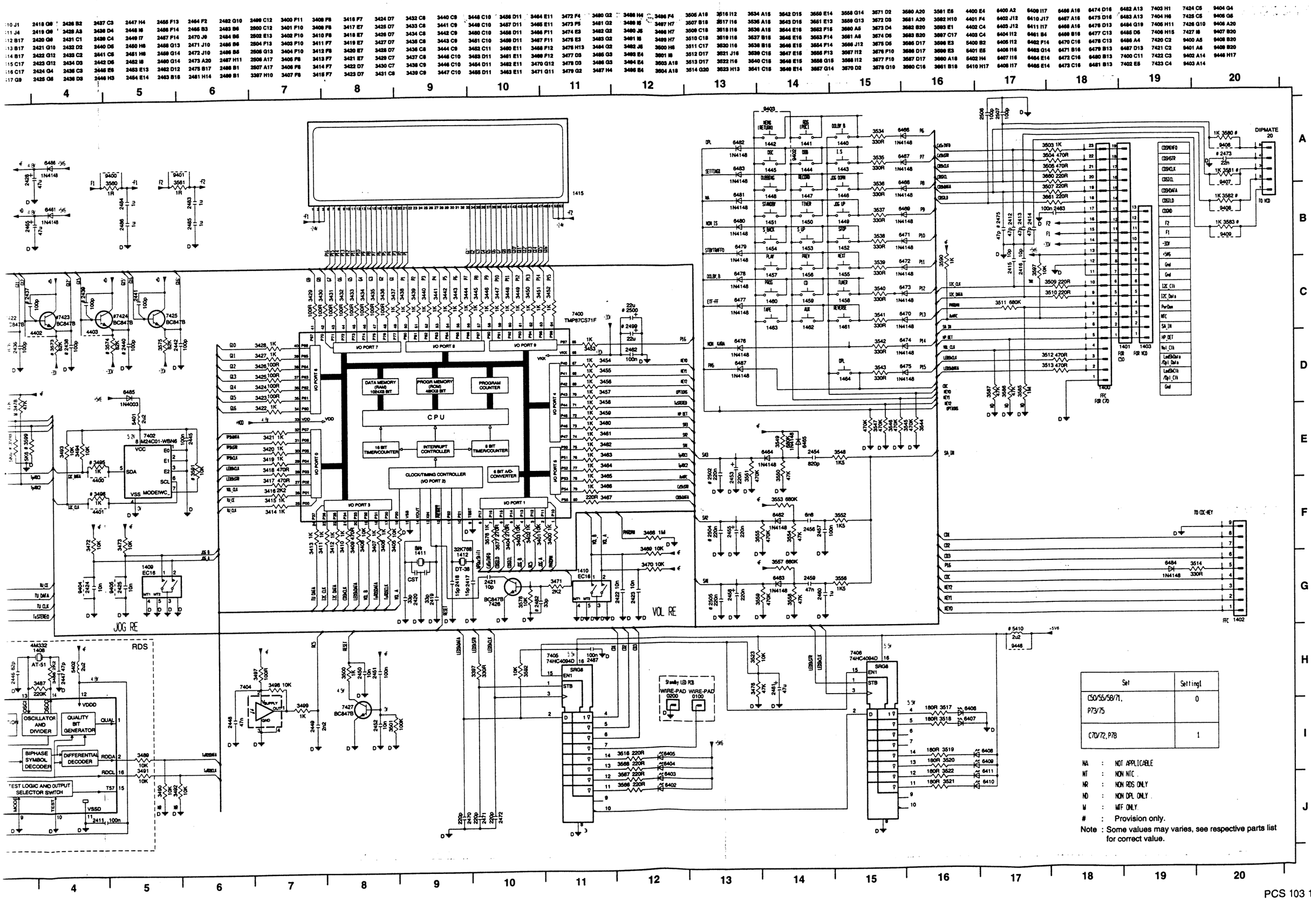


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CIRCUIT DIAGRAM

20 A20	1402 Q20	1411 F9	1445 A14	1463 B14	1461 C15	2402 E3	2410 J1	2418 G9	2426 B2	2437 C3	2447
21 D1	1403 D19	1412 F9	1446 B15	1464 B14	1462 C14	2403 H2	2411 J4	2419 G9	2428 A3	2438 D4	2448
23 E1	1404 D2	1415 B11	1447 B14	1455 C15	1463 C14	2404 H2	2412 B17	2420 G9	2431 C1	2439 C4	2449
25 E1	1406 F1	1440 A15	1448 B14	1456 C14	1464 D15	2405 H3	2413 B17	2421 G10	2432 D2	2440 D6	2450
0100 H13	1407 G1	1441 A14	1449 B15	1457 C14	1501 B2	2406 H3	2414 B17	2422 G12	2433 C2	2441 C6	2451
0200 H12	1408 H4	1442 A14	1450 B14	1458 C15	1502 B2	2407 H3	2415 C17	2423 G12	2434 D3	2442 D6	2452
1400 D18	1409 G5	1443 A15	1451 B14	1459 C14	2400 E3	2408 I1	2416 C17	2424 G4	2435 C3	2445 E6	2453
1401 D18	1410 G11	1444 A14	1452 B15	1460 C14	2401 E3	2409 I1	2417 G9	2425 G5	2436 D3	2446 H3	2454



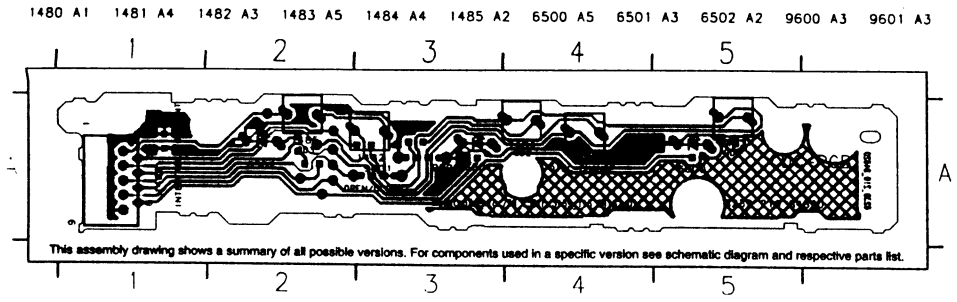


Set	Setting1
C50/55/58/71, P73/75	0
C70/72, P78	1

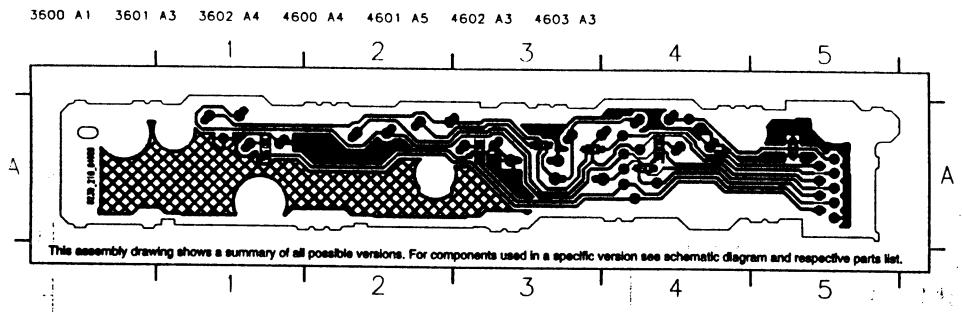
NA : NOT APPLICABLE
NT : NON NTC
NR : NON RDS ONLY
ND : NON DPL ONLY
W : WTF ONLY
: Provision only.

Note : Some values may varies, see respective parts list for correct value.

KEY-CDC BOARD - COMPONENT LAYOUT

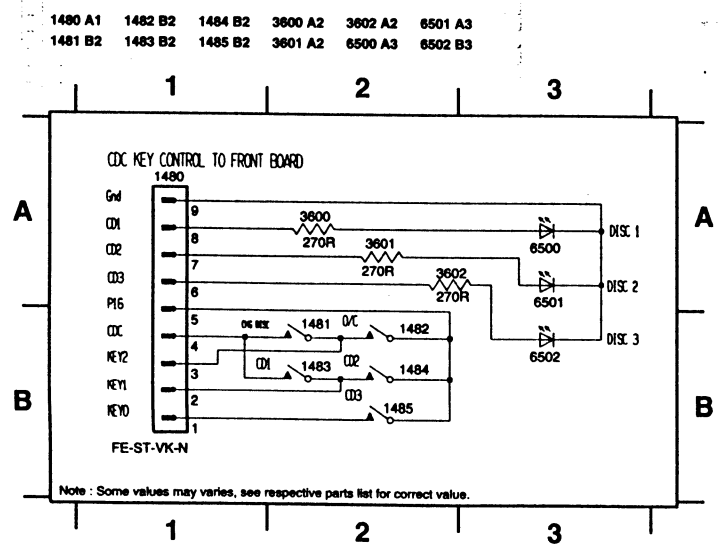

1480 A1 1481 A4 1482 A3 1483 A5 1484 A4 1485 A2 6500 A5 6501 A3 6502 A2 9600 A3 9601 A3
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC BOARD - CHIP LAYOUT

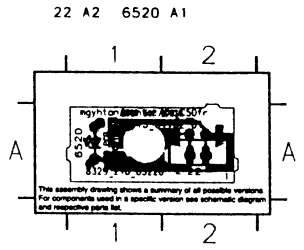

3600 A1 3601 A3 3602 A4 4600 A4 4601 A5 4602 A3 4603 A3
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC PART - CIRCUIT DIAGRAM

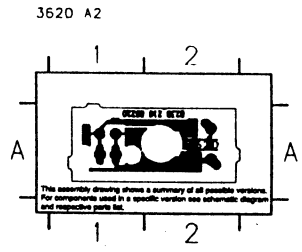
1480 A1 1482 B2 1484 B2 3600 A2 3602 A2 6501 A3
1481 B2 1483 B2 1485 B2 3601 A2 6500 A3 6502 B3



STANDBY LED BOARD - COMPONENT LAYOUT

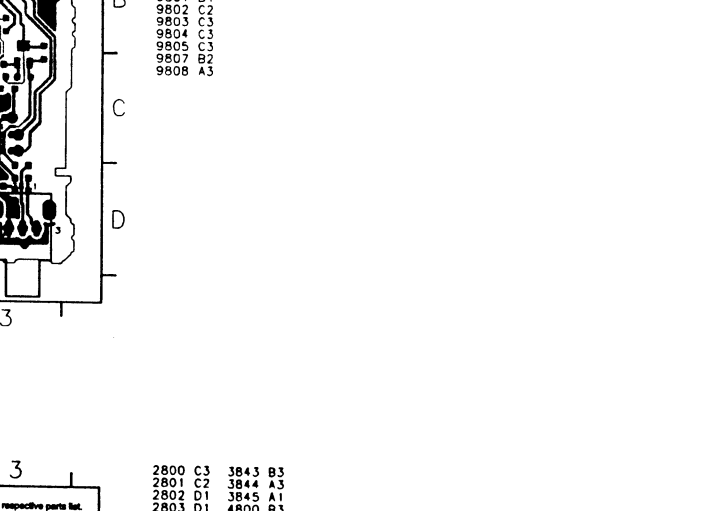

22 A2 6520 A1
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED BOARD - CHIP LAYOUT

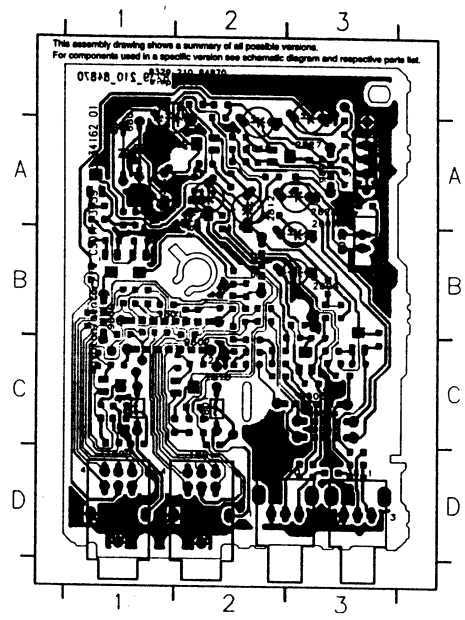

3620 A2
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED PART - CIRCUIT DIAGRAM

22 A1 3620 A2 6520 A2

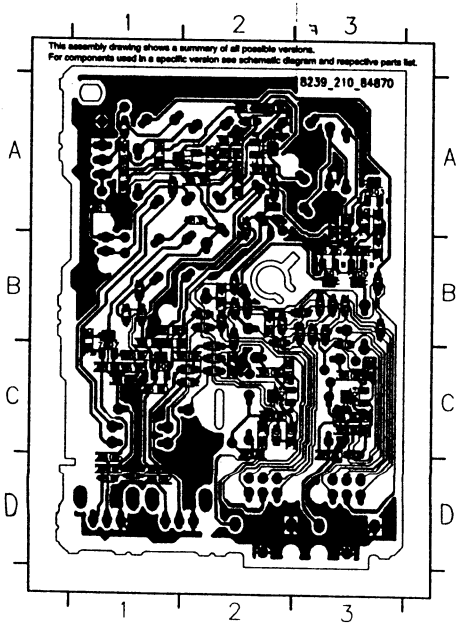


KARAOKE BOARD - COMPONENT LAYOUT


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

0029 B3
1800 D1
1801 D2
1804 A3
1810 C2
2806 B3
2807 A3
2812 A2
2814 A2
2815 A1
2818 A2
2819 A1
2827 A3
2828 A3
3810 D3
3811 D3
5801 C2
5802 C1
6800 A1
6801 A1
9800 B1
9801 B1
9802 C2
9803 C3
9804 C3
9805 C3
9807 B2
9808 A3

KARAOKE BOARD - CHIP LAYOUT

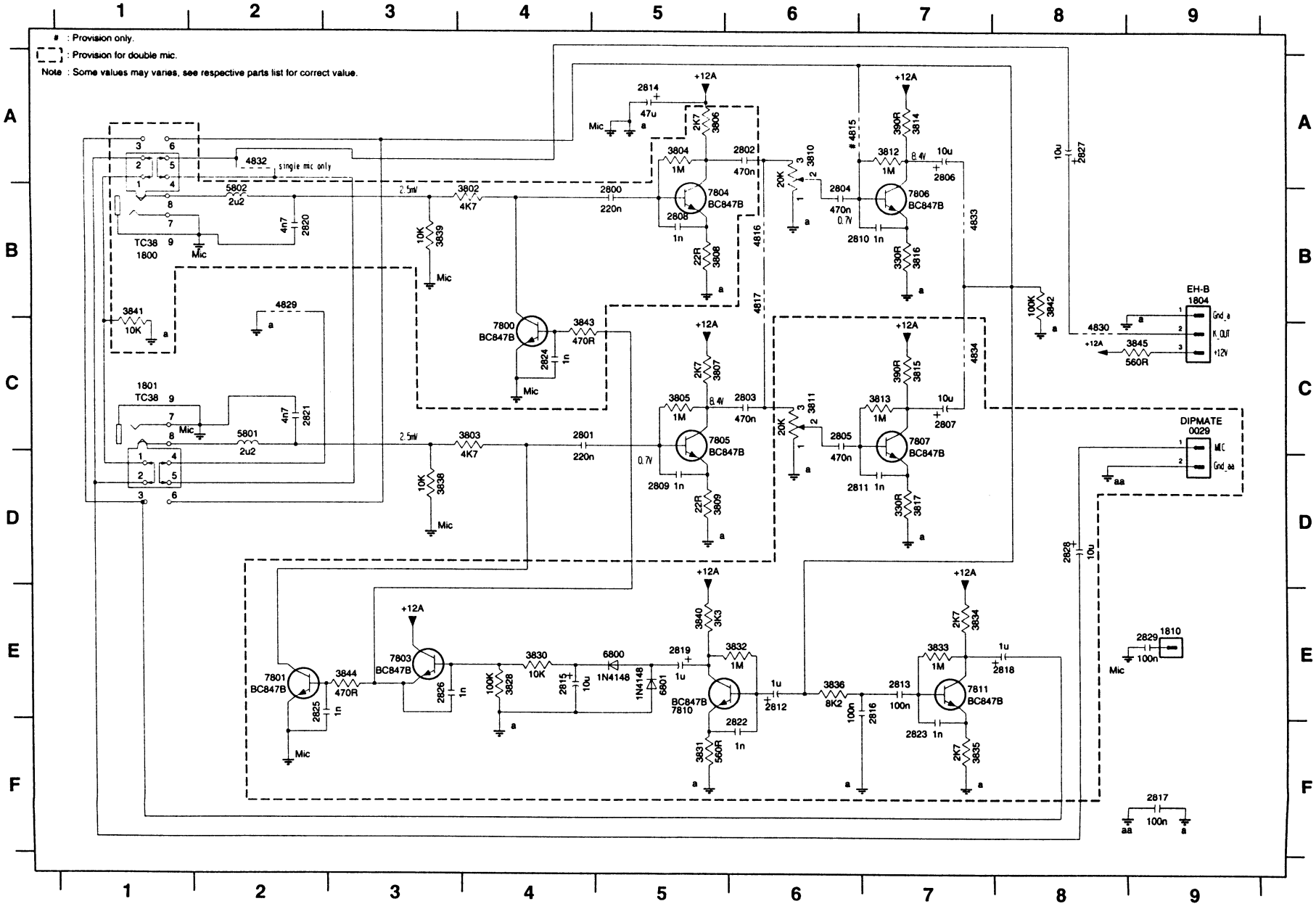

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
8239_210_84870

2800 C3 3843 B3
2801 C2 3844 A3
2802 D1 3845 A1
2803 D1 4800 B3
2804 D1 4801 B3
2805 D1 4802 B3
2808 C3 4803 B3
2809 C2 4804 B2
2810 C1 4805 B3
2811 C1 4806 B3
2813 A2 4807 B3
2816 A2 4808 B3
2817 A1 4810 C2
2820 C3 4811 B2
2821 C2 4812 C2
2822 A2 4813 C2
2823 A2 4814 A2
2824 B3 4815 B1
2825 B3 4816 D1
2826 A3 4817 D1
2829 C2 4818 C2
3802 C3 4819 B2
3803 C2 4820 C2
3804 C3 4821 B2
3805 C2 4822 B2
3806 C2 4823 B2
3807 C1 4824 B2
3808 C3 4825 A2
3809 C2 4826 A2
3812 C1 4827 A1
3813 C1 4828 B2
3814 C1 4829 B2
3815 C1 4830 A1
3816 B1 4831 B3
3817 C1 4832 B3
3828 A3 4833 B1
3830 A3 4834 A2
3831 A2 4835 B1
3832 A2 7800 B3
3833 A1 7801 B3
3834 A1 7803 A3
3835 A2 7804 C3
3836 A2 7805 C2
3838 C2 7806 C1
3839 C3 7807 C1
3840 A2 7810 A2
3841 B2 7811 A2
3842 B2

6-5

KARAOKE PART - CIRCUIT DIAGRAM

0029 C9	1810 E9	2803 C6	2807 C7	2811 D6	2815 E4	2819 E5	2823 F7	2827 A8	3803 C4	3807 C5	3811 C6	3815 C7	3830 E4	3834 E7	3839 B3	3843 C4	4816 B6	4832 A2	5802 B2	7801 E2	7806 B7
1800 B1	2800 B5	2804 B6	2808 B5	2812 E6	2816 E7	2820 B2	2824 C4	2828 D6	3804 A5	3808 B5	3812 A7	3816 B7	3831 F5	3835 F7	3840 E5	3844 E3	4817 B6	4833 B7	6800 E5	7803 E3	7807 C7
1801 C1	2801 C4	2805 C6	2809 D5	2813 E7	2817 F9	2821 C2	2825 E2	2829 E9	3805 C5	3809 D5	3813 C7	3817 D7	3832 E6	3836 E6	3841 B1	3845 C9	4829 B2	4834 C7	6801 E5	7804 B5	7810 E5
1804 B9	2802 A6	2806 A7	2810 B6	2814 A5	2818 E8	2822 F6	2826 E3	3802 B4	3806 A5	3810 A6	3814 A7	3828 E4	3833 E7	3838 D3	3842 B8	4815 A6	4830 C8	5801 C2	7800 C4	7805 C5	7811 E7



ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1401	482226511545	Flex Connector 19P
1402	482226511531	Flex Connector 9P
1404	482226710953	Flex Connector 7P
1408	482224272195	QUARZ 4,332MHz
1409	482227310366	Rotary Encoder 24P
1410	482227310365	Rotary Encoder 24P
1411	482224272066	Ceramic Resonator
1412	242254301069	RES XTL 32kHz768
1415	313911052230	FTD Display
1441	482227613775	Tact Switch
1442	482227613775	Tact Switch
1443	482227613775	Tact Switch
1444	482227613775	Tact Switch
1445	482227613775	Tact Switch
1447	482227613775	Tact Switch
1448	482227613775	Tact Switch
1450	482227613775	Tact Switch
1451	482227613775	Tact Switch
1452	482227613775	Tact Switch
1453	482227613775	Tact Switch
1454	482227613775	Tact Switch
1455	482227613775	Tact Switch
1456	482227613775	Tact Switch
1457	482227613775	Tact Switch
1458	482227613775	Tact Switch
1459	482227613775	Tact Switch
1460	482227613775	Tact Switch
1461	482227613775	Tact Switch
1462	482227613775	Tact Switch
1463	482227613775	Tact Switch
1480	482226511531	Flex Connector 9P
1481	482227613775	Tact Switch
1482	482227613775	Tact Switch
1483	482227613775	Tact Switch
1484	482227613775	Tact Switch
1485	482227613775	Tact Switch
1801	482226511529	Headphone Socket

CAPACITORS

2400	532212232448	10pF 5% 63V
2401	532212232448	10pF 5% 63V
2402	532212232448	10pF 5% 63V
2403	482212613692	47pF 1% 63V
2404	482212613692	47pF 1% 63V
2405	482212613692	47pF 1% 63V
2406	482212613692	47pF 1% 63V
2407	482212613692	47pF 1% 63V
2408	482212233173	560pF 10% 50V
2409	482212233173	560pF 10% 50V
2410	482212422652	2,2µF 20% 50V
2411	482212614585	100nF 10% 50V
2412	482212613692	47pF 1% 63V
2413	482212613692	47pF 1% 63V
2414	482212613692	47pF 1% 63V
2415	532212232448	10pF 5% 63V
2416	532212232448	10pF 5% 63V
2417	482212613486	15pF 2% 63V
2418	482212613486	15pF 2% 63V
2419	532212232659	33pF 5% 50V
2420	532212232659	33pF 5% 50V
2421	532212232448	10pF 5% 63V
2422	482212233177	10nF 20% 50V
2423	482212233177	10nF 20% 50V
2424	482212151387	10nF 20% 16V
2425	482212151387	10nF 20% 16V
2426	482212480483	47µF 20% 6,3V
2428	482212480483	47µF 20% 6,3V
2431	532212232531	100pF 5% 50V
2432	532212232531	100pF 5% 50V
2433	532212232531	100pF 5% 50V
2434	532212232531	100pF 5% 50V
2435	532212232531	100pF 5% 50V
2436	532212232531	100pF 5% 50V
2441	532212232531	100pF 5% 50V
2442	532212232531	100pF 5% 50V
2445	482212614585	100nF 10% 50V
2446	482212613695	82pF 1% 63V
2447	482212613692	47pF 1% 63V
2448	482212613751	47nF 10% 63V
2449	482212233127	2,2nF 10% 63V
2450	532212234098	10nF 10% 63V
2451	482212614585	100nF 10% 50V
2452	532212234098	10nF 10% 63V
2453	482212440746	0,22µF 20% 63V
2454	532212610184	820pF 5% 50V
2455	482212440746	0,22µF 20% 63V
2456	532212231866	6,8nF 10% 63V
2457	482212614585	100nF 10% 50V
2458	482212440746	0,22µF 20% 63V
2459	482212613751	47nF 10% 63V
2460	482212614043	1µF +80/-20% 16V
2462	482212613838	100nF +80/-20% 50V
2463	482212614585	100nF 10% 50V
2464	532212232531	100pF 5% 50V
2465	482212480483	47µF 20% 6,3V
2470	482212233575	220pF 5% 63V
2471	482212233575	220pF 5% 63V
2472	482212233575	220pF 5% 63V
2481	482212480483	47µF 20% 6,3V
2483	482212614043	1µF +80/-20% 16V
2484	482212614043	1µF +80/-20% 16V
2485	482212614043	1µF +80/-20% 16V
2486	482212614043	1µF +80/-20% 16V
2487	482212614585	100nF 10% 50V

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ELECTRICAL PARTS LIST - FRONT BOARD

2488	482212613838	100nF +80/-20% 50V
2489	482212613838	100nF +80/-20% 50V
2506	532212232531	100pF 5% 50V
2507	532212232531	100pF 5% 50V
2801	482212614076	220nF +80/-20% 25V
2803	482212613482	470nF +80/-20% 16V
2804	482212613482	470nF +80/-20% 16V
2806	482212440248	10µF 20% 63V
2809	532212231647	1nF 10% 63V
2810	532212231647	1nF 10% 63V
2814	482212440433	47µF 20% 25V
2817	482212614585	100nF 10% 50V
2821	532212610223	4,7nF 10% 63V
2827	482212440248	10µF 20% 63V
2829	482212613838	100nF +80/-20% 50V

RESISTORS

3397	482211713577	330R 1% 1,25W
3400	482205110102	1k 2% 0,25W
3401	482211710833	10k 1% 0,1W
3402	482205110102	1k 2% 0,25W
3403	482211710833	10k 1% 0,1W
3404	482211711504	270R 1% 0,1W
3405	482211710833	10k 1% 0,1W
3406	482205110102	1k 2% 0,25W
3407	482205110102	1k 2% 0,25W
3408	482211710833	10k 1% 0,1W
3409	482205120471	470R 5% 0,1W
3410	482205110102	1k 2% 0,25W
3411	482205110102	1k 2% 0,25W
3412	482205110102	1k 2% 0,25W
3413	482205110102	1k 2% 0,25W
3414	482205110102	1k 2% 0,25W
3415	482205110102	1k 2% 0,25W
3416	482211711449	2k2 1% 0,1W
3417	482205120471	470R 5% 0,1W
3418	482205120471	470R 5% 0,1W
3419	482205110102	1k 2% 0,25W
3420	482205110102	1k 2% 0,25W
3421	482205110102	1k 2% 0,25W
3422	482205110102	1k 2% 0,25W
3423	482205120101	100R 5% 0,1W
3424	482205120101	100R 5% 0,1W
3425	482205120101	100R 5% 0,1W
3426	482205120101	100R 5% 0,1W
3427	482205110102	1k 2% 0,25W
3428	482205110102	1k 2% 0,25W
3429	482205120101	100R 5% 0,1W
3430	482205120101	100R 5% 0,1W
3431	482205120101	100R 5% 0,1W
3432	482205120101	100R 5% 0,1W
3433	482205120101	100R 5% 0,1W
3434	482205120101	100R 5% 0,1W
3435	482205120101	100R 5% 0,1W
3436	482205120101	100R 5% 0,1W
3437	482205110102	1k 2% 0,25W
3438	482205110102	1k 2% 0,25W
3439	482205110102	1k 2% 0,25W
3440	482205110102	1k 2% 0,25W
3441	482205110102	1k 2% 0,25W
3442	482205110102	1k 2% 0,25W
3443	482205110102	1k 2% 0,25W
3444	482205110102	1k 2% 0,25W
3445	482205110102	1k 2% 0,25W
3446	482205110102	1k 2% 0,25W
3447	482205110102	1k 2% 0,25W
3448	482205110102	1k 2% 0,25W
3449	482205110102	1k 2% 0,25W
3450	482205110102	1k 2% 0,25W
3451	482205110102	1k 2% 0,25W
3452	482205110102	1k 2% 0,25W
3453	482205110102	1k 2% 0,25W
3454	482205110102	1k 2% 0,25W
3455	482205110102	1k 2% 0,25W
3456	482205110102	1k 2% 0,25W
3457	482205110102	1k 2% 0,25W
3458	482205110102	1k 2% 0,25W
3459	482205110102	1k 2% 0,25W
3460	482205110102	1k 2% 0,25W
3461	482205110102	1k 2% 0,25W
3462	482205110102	1k 2% 0,25W
3463	482205110102	1k 2% 0,25W
3464	482205110102	1k 2% 0,25W
3465	482205110102	1k 2% 0,25W
3466	482205110102	1k 2% 0,25W
3467	482211711503	220R 1% 0,1W
3468	482205120105	1M 5% 0,1W
3469	482211710833	10k 1% 0,1W
3470	482211710833	10k 1% 0,1W
3471	482211711449	2k2 1% 0,1W
3472	482211710833	10k 1% 0,1W
3473	482211710833	10k 1% 0,1W
3474	482211652175	100R 5% 0,5W
3475	482211652175	100R 5% 0,5W
3476	482211710834	47k 1% 0,1W
3479	482205110102	1k 2% 0,25W
3480	482205110102	1k 2% 0,25W
3481	482205110102	1k 2% 0,25W
3482	482205110102	1k 2% 0,25W
3483	482205110102	1k 2% 0,25W
3484	482211710833	10k 1% 0,1W
3485	482211710833	10k 1% 0,1W
3486	482205021003	10k 1% 0,6W
3487	482211713579	220k 1% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3488	482211711449	2k2 1% 0,1W
3489	482211710833	10k 1% 0,1W
3490	482211710833	10k 1% 0,1W
3491	482211710833	10k 1% 0,1W
3492	482211710833	10k 1% 0,1W
3493	482211710833	10k 1% 0,1W
3494	482211710833	10k 1% 0,1W
3497	482205120101	100R 5% 0,1W
3498	482211710833	10k 1% 0,1W
3499	482205110102	1k 2% 0,25W
3500	482205110102	1k 2% 0,25W
3501	482211710837	100k 1% 0,1W
3503	482205110102	1k 2% 0,25W
3504	482205120471	470R 5% 0,1W
3505	482205120471	470R 5% 0,1W
3507	482211711503	220R 1% 0,1W
3509	482211711503	220R 1% 0,1W
3510	482211711503	220R 1% 0,1W
3511	482211652298	680k 5% 0,5W
3514	482211713577	330R 1% 1,25W
3516	482211711503	220R 1% 0,1W
3523	482211710833	10k 1% 0,1W
3534	482211713577	330R 1% 1,25W
3535	482211713577	330R 1% 1,25W
3536	482211713577	330R 1% 1,25W
3537	482211713577	330R 1% 1,25W
3538	482211713577	330R 1% 1,25W
3539	482211713577	330R 1% 1,25W
3540	482211713577	330R 1% 1,25W
3541	482211713577	330R 1% 1,25W
3542	482211713577	330R 1% 1,25W
3543	482211713577	330R 1% 1,25W
3544	482205120474	470k 5% 0,1W
3545	482205120474	470k 5% 0,1W
3546	482205120474	470k 5% 0,1W
3547	482205120474	470k 5% 0,1W
3548	482211711139	1k5 1% 0,1W
3549	482205120684	680k 5% 0,1W
3550	482211710834	47k 1% 0,1W
3551	482205120474	470k 5% 0,1W
3552	482211711139	1k5 1% 0,1W
3553	482205120684	680k 5% 0,1W
3554	482211710834	47k 1% 0,1W
3555	482205120474	470k 5% 0,1W
3556	482211711139	1k5 1% 0,1W
3557	482205120684	680k 5% 0,1W
3558	482211710834	47k 1% 0,1W
3559	482205120474	470k 5% 0,1W
3560	482211680176	1R 5% 0,5W
3561	482211680176	1R 5% 0,5W
3566	482211711503	220R 1% 0,1W
3567	482211711503	220R 1% 0,1W
3568	482211711503	220R 1% 0,1W
3570	482211711149	82k 1% 0,1W
3571	482211711149	82k 1% 0,1W
3572	482211711149	82k 1% 0,1W
3575	482211711149	82k 1% 0,1W
3576	482205110102	1k 2% 0,25W
3577	482211711504	270R 1% 0,1W
3578	482211710833	10k 1% 0,1W
3586	482211683884	47k 5% 0,5W
3587	482211683884	47k 5% 0,5W
3592	482205021003	10k 1% 0,6W
3600	482211711504	270R 1% 0,1W
3601	482211711504	270R 1% 0,1W
3602	482211711504	270R 1% 0,1W
3660	482211711503	220R 1% 0,1W
3661	482211711503	220R 1% 0,1W
3803	482205120472	4k7 5% 0,1W
3805	482205120105	1M 5% 0,1W
3807	482211712955	2k7 1% 0,1W
3809	482205120229	22R 5% 0,1W
3810	482210121204	20kA
3812	482205120105	1M 5% 0,1W
3814	482205120391	390R 5% 0,1W
3816	482211713577	330R 1% 1,25W
3838	482211710833	10k 1% 0,1W
3842	482211710837	100k 1% 0,1W
3845	482205120561	560R 5% 0,1W
4400	482205120008	0R Jumper 0805
4401	482205120008	0R Jumper 0805
4402	482205120008	0R Jumper 0805
4403	482205120008	0R Jumper 0805
4420	482205120008	0R Jumper 0805
4421	482205120008	0R Jumper 0805
4422	482205120008	0R Jumper 0805
4423	482205120008	0R Jumper 0805
4424	482205120008	0R Jumper 0805
4425	482205120008	0R Jumper 0805
4426	482205120008	0R Jumper 0805
4427	482205120008	0R Jumper 0805
4428	482205120008	0R Jumper 0805
4429	482205120008	0R Jumper 0805
4430	482205120008	0R Jumper 0805
4431	482205120008	0R Jumper 0805
4432	482205120008	0R Jumper 0805
4433	482205120008	0R Jumper 0805
4434	482205120008	0R Jumper 0805
4435	482205120008	0R Jumper 0805
4436	482205120008	0R Jumper 0805
4437	482205120008	0R Jumper 0805
4438	482205120008	0R Jumper 0805
4439	482205120008	0R Jumper 0805
4440	482205120008	0R Jumper 0805

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ELECTRICAL PARTS LIST - FRONT BOARD

4441	482205120008	0R Jumper 0805
4442	482205120008	0R Jumper 0805
4443	482205120008	0R Jumper 0805
4445	482205120008	0R Jumper 0805
4446	482205120008	0R Jumper 0805
4447	482205120008	0R Jumper 0805
4448	482205120008	0R Jumper 0805
4449	482205120008	0R Jumper 0805
4450	482205120008	0R Jumper 0805
4451	482205120008	0R Jumper 0805
4452	482205120008	0R Jumper 0805
4453	482205120008	0R Jumper 0805
4454	482205120008	0R Jumper 0805
4455	482205120008	0R Jumper 0805
4456	482205120008	0R Jumper 0805
4457	482205120008	0R Jumper 0805
4458	482205120008	0R Jumper 0805
4459	482205120008	0R Jumper 0805
4460	482205120008	0R Jumper 0805
4461	482205120008	0R Jumper 0805
4462	482205120008	0R Jumper 0805
4463	482205120008	0R Jumper 0805
4464	482205120008	0R Jumper 0805
4465	482205120008	0R Jumper 0805
4466	482205120008	0R Jumper 0805
4467	482205120008	0R Jumper 0805
4468	482205120008	0R Jumper 0805
4469	482205120008	0R Jumper 0805
4471	482205120008	0R Jumper 0805
4473	482205120008	0R Jumper 0805
4474	482205120008	0R Jumper 0805
4475	482205120008	0R Jumper 0805
4476	482205120008	0R Jumper 0805
4477	482205120008	0R Jumper 0805
4478	482205120008	0R Jumper 0805
4479	482205120008	0R Jumper 0805
4480	482205120008	0R Jumper 0805
4481	482205120008	0R Jumper 0805
4482	482205120008	0R Jumper 0805
4484	482205120008	0R Jumper 0805
4485	482205120008	0R Jumper 0805
4490	482205120008	0R Jumper 0805
4492	482205120008	0R Jumper 0805
4493	482205120008	0R Jumper 0805
4494	482205120008	0R Jumper 0805
4495	482205120008	0R Jumper 0805
4496	482205120008	0R Jumper 0805
4497	482205120008	0R Jumper 0805
4600	482205120008	0R Jumper 0805
4601	482205120008	0R Jumper 0805
4602	482205120008	0R Jumper 0805
4603	482205120008	0R Jumper 0805
4800	482205120008	0R Jumper 0805
4803	482205120008	0R Jumper 0805
4806	482205120008	0R Jumper 0805
4808	482205120008	0R Jumper 0805
4810	482205120008	0R Jumper 0805
4812	482205120008	0R Jumper 0805
4813	482205120008	0R Jumper 0805
4814	482205120008	0R Jumper 0805
4816	482205120008	0R Jumper 0805
4817	482205120008	0R Jumper 0805
4821	482205120008	0R Jumper 0805
4822	482205120008	0R Jumper 0805
4824	482205120008	0R Jumper 0805
4825	482205120008	0R Jumper 0805
4826	482205120008	0R Jumper 0805
4829	482205120008	0R Jumper 0805
4830	482205120008	0R Jumper 0805
4832	482205120008	0R Jumper 0805
4833	482205120008	0R Jumper 0805
4835	482205120008	0R Jumper 0805

COILS & FILTERS

5400	482215762552	Coil 2,2µH 5%
5401	482215762552	Coil 2,2µH 5%
5402	482215762552	Coil 2,2µH 5%
5801	482215762552	Coil 2,2µH 5%

DIODES

6400	482213031878	1N4003G
6402	482213010791	LTL-1CHGE
6403	482213010791	LTL-1CHGE
6404	482213010791	LTL-1CHGE
6405	482213010791	LTL-1CHGE
6461	482213030621	1N4148
6462	482213030621	1N4148
6463	482213030621	1N4148
6464	482213030621	1N4148
6465	482213030621	1N4148
6466	482213030621	1N4148
6467	482213030621	1N4148
6468	482213030621	1N4148
6469	482213030621	1N4148
6470	482213030621	1N4148
6471	482213030621	1N4148
6472	482213030621	1N4148
6473	482213030621	1N4148
6474	482213030621	1N4148
6475	482213030621	1N4148
6476	482213030621	1N4148
6484	482213030621	1N4148
6485	482213031878	1N4003G
6486	482213030621	1N4148

ELECTRICAL PARTS LIST - FRONT BOARD

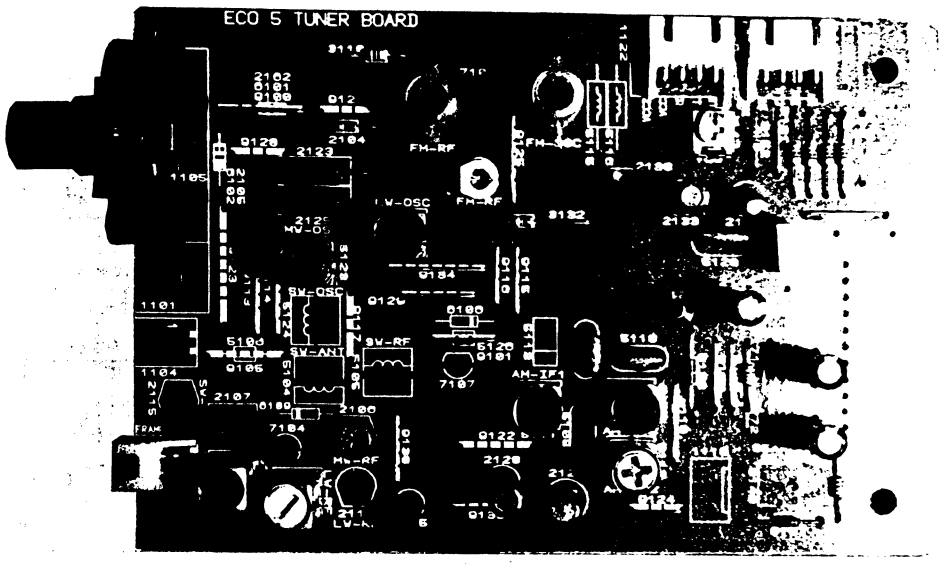
DIODES

6500	482213010791	LTL-1CHGE
6501	482213010791	LTL-1CHGE
6502	482213010791	LTL-1CHGE

TRANSISTORS & INTEGRATED CIRCUITS

7400	313911052190	TMP87CS71F - 'C55S52191'
7402	932214319682	M24C01-WBN6
7403	482220931981	SAA6579T/V1
7404	482213010165	GP1U28XP
7405	482220915449	74HC4094D
7420	482213060511	BC847B
7421	482213060511	BC847B
7422	482213060511	BC847B
7425	482213060511	BC847B
7426	482213060511	BC847B
7427	482213060511	BC847B
7805	482213060511	BC847B
7806	482213060511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.



TUNER BOARD ECO5

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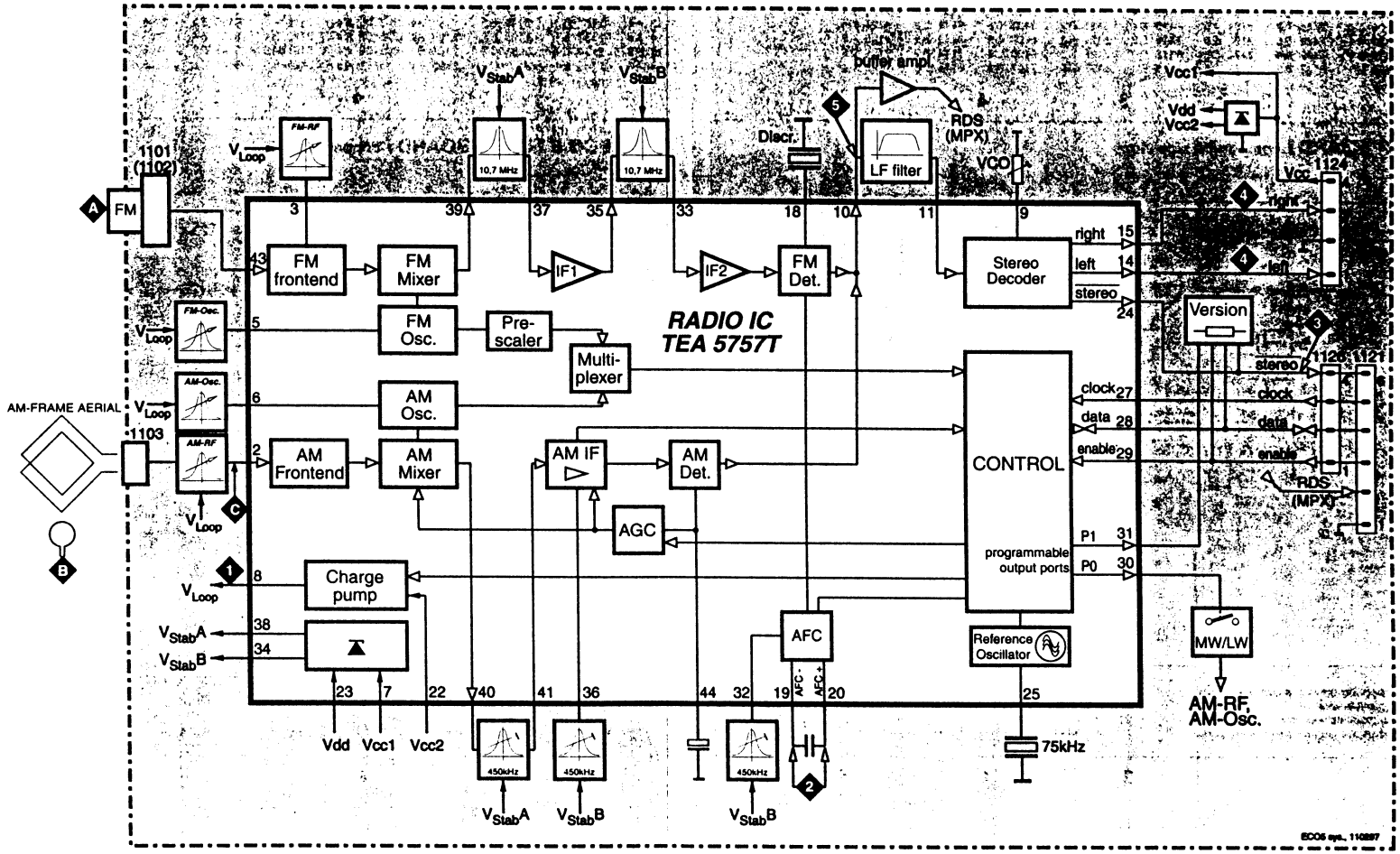
7B-1

BLOCKDIAGRAM

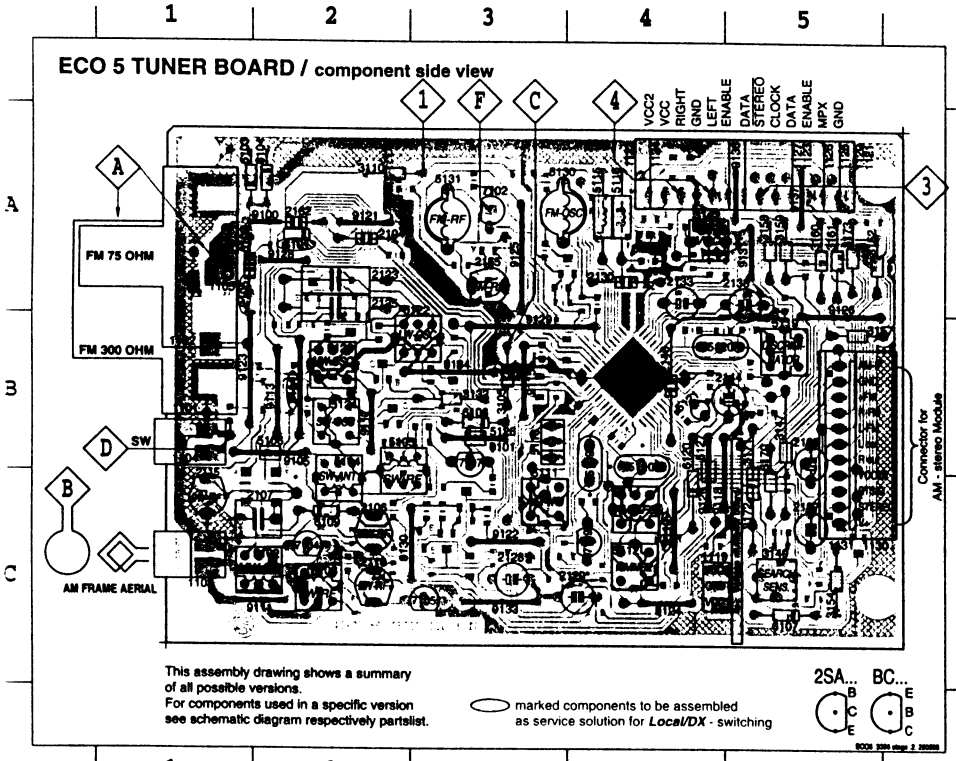
TUNER BOARD
ECO 5 systems

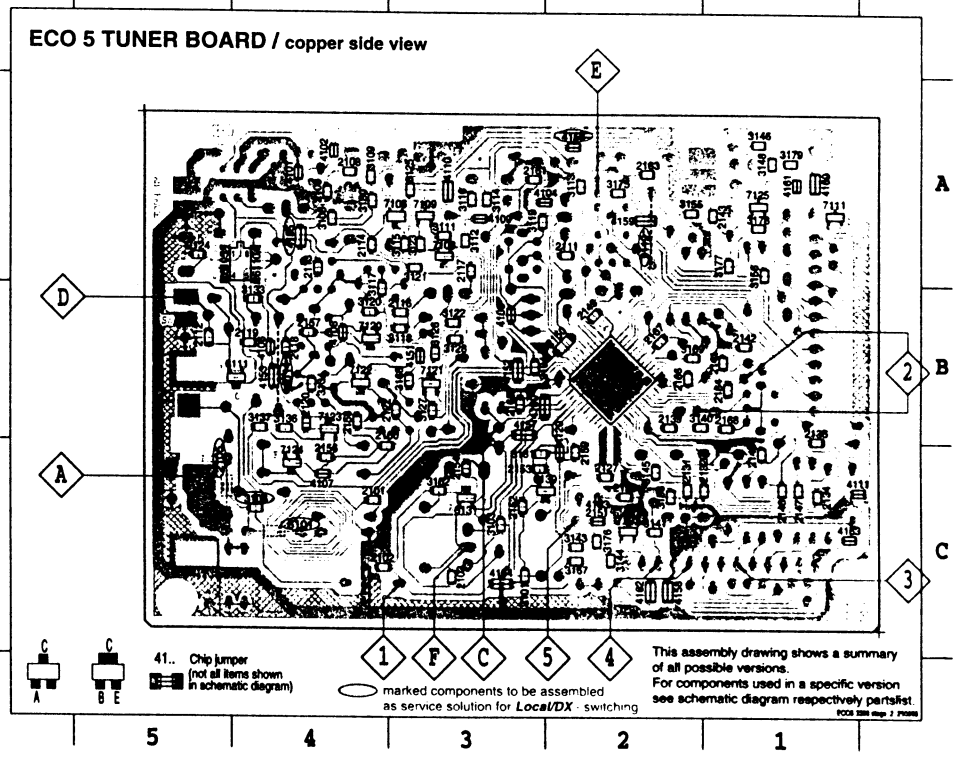


7B-2

1101 A1	2106 C2	2137 C5	3149 C5	3173 A5	5114 C4	5130 A3	7104 C2	9117 B2	9129 B3	
1102 A1	2107 C2	2138 A5	3152 A5	5102 C2	5115 A4	5131 A3	7105 C3	9118 B4	9130 C3	
1103 C1	2110 C2	2144 B5	3154 C5	5103 C2	5116 A4	6101 A2	7107 B3	9119 C4	9131 A5	
1104 B1	2115 C1	2148 B4	3157 B5	5104 C2	5119 B5	6102 A1	7119 C4	9120 B4	9133 C3	
1105 A1	2123 A2	2155 A3	3158 A5	5105 B2	5120 B4	6103 A1	9100 A2	9121 A2	9134 B3	
1119 C5	2125 A2	2162 A2	3159 A5	5106 B2	5121 B4	6104 A2	9101 B3	9122 C3	9136 A5	
1120 A5	2128 C3	3105 B3	3160 A5	5109 B4	5122 B3	6106 B3	9105 B2	9123 B1	9137 A5	
1130 B5	2129 C4	3110 A2	3161 A5	5110 B4	5123 B2	6107 C5	9111 C2	9124 C4		
1131 B5	2130 A4	3132 B3	3170 C5	5111 C3	5124 B2	6109 C2	9113 B2	9125 A3		
2104 A2	2133 A4	3142 A4	3171 C5	5112 C4	5126 B3	6120 C4	9114 B2	9126 B5		
2105 A1	2135 B5	3147 B5	3172 C5	5113 B3	5127 B4	7102 A3	9115 B3	9128 A2		

2101 C4	2118 B4	2139 B2	2153 C3	2166 B2	3112 A3	3123 A3	3143 C2	3175 A2	4105 B3	4153 B4	6105 A4	7120 B4	
2102 C4	2119 B4	2141 B1	2154 C3	2167 B2	3113 A2	3125 A3	3144 C2	3176 C2	4106 B4	4154 C3	6110 A4	7121 B3	
2103 C3	2120 B4	2142 B1	2156 C4	2168 B1	3114 A3	3126 B3	3145 C2	3177 A1	4107 C4	4155 A4	6111 B4	7122 B4	
2108 A4	2122 B3	2143 A1	2157 B4	3101 C3	3115 A3	3127 B3	3146 A1	3178 A1	4108 B4	4156 A2	6130 C2	7123 B4	
2109 A4	2124 A5	2145 C1	2158 B4	3102 C3	3116 A3	3128 B3	3148 A1	3179 A1	4109 A3	4157 B3	6131 C3	7124 C4	
2111 A2	2126 C2	2146 C1	2159 C2	3103 C3	3117 B4	3133 B4	3153 C2	3180 A4	4110 A3	4158 C2	7101 B2	7125 A1	
2112 B5	2127 C2	2147 C1	2160 C4	3104 B3	3118 B3	3134 B4	3155 A2	3181 C3	4111 C1	4159 A2	7103 C2		
2113 A4	2131 C2	2149 B2	2161 A3	3106 C4	3119 A3	3136 B4	3156 A1	4101 A4	4120 C2	4160 A1	7106 A3		
2114 A4	2132 C1	2150 B2	2163 A2	3108 A4	3120 B4	3137 B4	3167 C2	4102 A4	4150 B2	4161 A1	7108 A3		
2116 B3	2134 C1	2151 C2	2164 B1	3109 A4	3121 A3	3140 B2	3168 B3	4103 C2	4151 B3	4162 C1	7109 A3		
2117 A3	2136 B1	2152 C3	2165 B3	3111 A3	3122 B3	3141 C2	3169 B2	4104 A2	4152 B3	4163 C1	7111 A1		




ECO 5 TUNER BOARD / copper side view
41.. Chip jumper (not all items shown in schematic diagram)
marked components to be assembled as service solution for Local/DX - switching
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	◇F	IC 7101 21 — shortcircuit to block AFC — 2141	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	◇C Δf=±15kHz V_{RF} = 3mV	IC 7101 36 — 100nF — 220R	5111	◇4	max. f_o symmetric
			IC 7101 40 — 100nF — 220R — see remark [2]	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 10mV		5114	◇2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇4	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO5 sscr ast 080797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

Repeat

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805 5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W 5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

7B-4

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

3176	4822 051 10102	1k 2% 0,25W	for RDS version
3180	4822 051 20223	22k 5% 0,1W	for LW version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.

TUNER BOARD ECO5 / Systems

VERSION PROGRAMMING COMPONENTS					
	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

Service Solution for Local/DX - switching

DISCRIMINATOR

2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1 and 3103 306 3396.1

3140 and 5120 provisional as alternative

buffer amplifier

AM-OSCILLATOR

Programmable Output Ports

version detection

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path
FM
AM
MPX (Audio Frequency)
AF - left/right

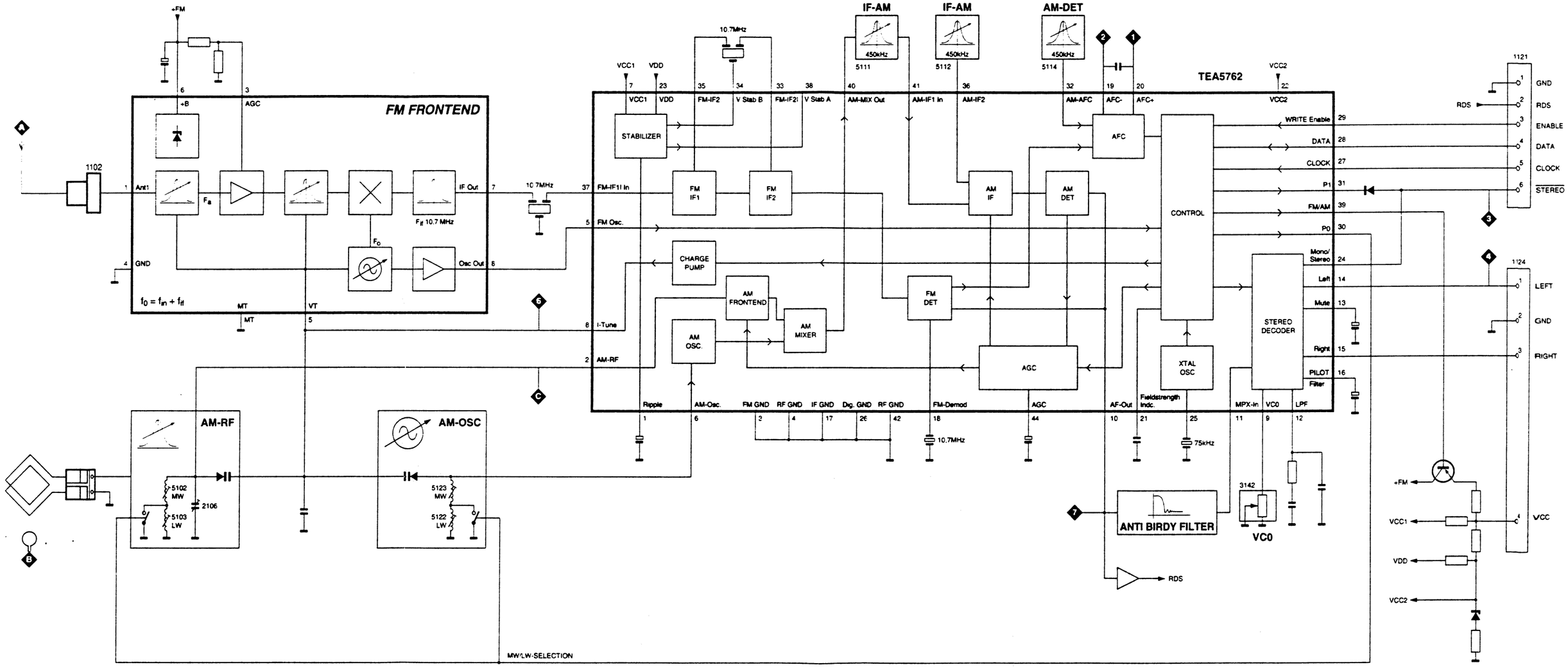
Vdc FM mode stereo
Vdc MW mode
Vdc LW mode

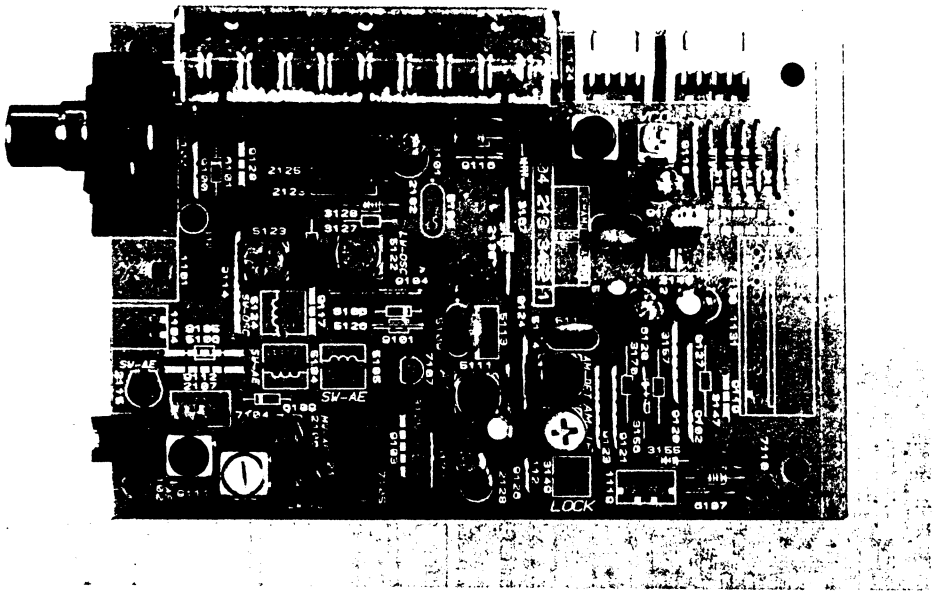
Voltages measured while set is tuned to a strong transmitter

ECO5 systeem, deel co5, 020698

7D-1

BLOCKDIAGRAM





TUNER 95 BOARD

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TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check		7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check	◇6	1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave *short pin 21 (IC7101) to ground*	◇A	98 MHz	5107	◇1 ◇2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	◇A	98 MHz	3142	◇3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇A	98MHz	mixcoil inside Tuner 1110	◇4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	100nF 50E	MW	5111	◇7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave	◇C		5114	◇1 ◇2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇B	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

adjustable for 3104 217 04121/04341

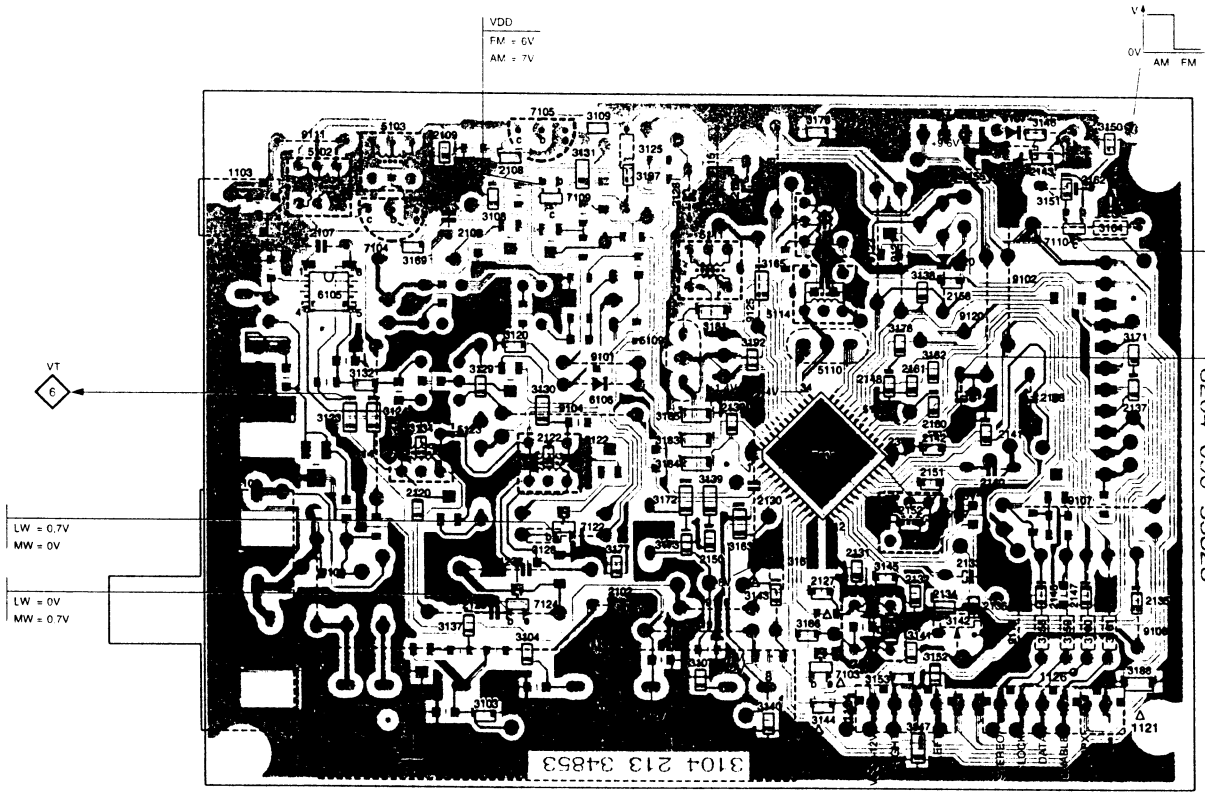
* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

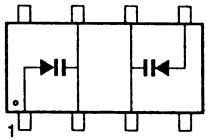
7D-2

1102	F4	2107	C4	2128	C7	2136	G10	2144	E10	2160	E9	3120	D6	3132	E5	3143	G8	3153	G9	3163	F8	3176	D9	3188	G11	5111	C8	6106	E7	7110	D11	9106	G11	9121	D9
1103	C4	2108	C6	2129	C8	2137	E11	2145	G11	2161	E9	3123	E4	3134	E5	3144	H9	3154	C10	3164	C11	3177	F7	3192	D8	5112	C9	6107	B10	7122	F7	9111	C4	9123	D9
1110	G7	2109	C5	2130	F8	2138	E10	2147	G11	2162	C11	3124	E5	3137	G5	3145	F9	3155	C10	3165	D6	3178	B8	3197	C7	5114	D6	6120	D10	7124	G6	9114	E5	9125	D6
1121	H11	2120	F5	2131	F9	2139	E8	2148	E9	3103	H6	3125	C7	3138	D9	3146	B10	3158	G11	3167	F8	3181	D8	5102	C4	5115	G9	7101	E9	9100	F4	9115	C8	9126	C8
1124	H9	2122	E8	2132	F9	2140	F10	2150	F8	3104	G6	3128	F6	3139	F8	3147	H9	3159	G11	3169	D5	3183	E7	5103	C5	5121	E9	7103	G9	9101	E7	9116	G8		
1126	G10	2123	F6	2133	F10	2141	E10	2151	F9	3107	G7	3129	E6	3140	H8	3150	C11	3160	G11	3171	D11	3184	E7	5107	F10	5122	E7	7104	D5	9102	D10	9118	G10		
2102	G7	2125	G6	2134	G10	2142	E9	2152	F9	3108	C6	3130	E6	3141	G9	3151	C10	3161	G11	3172	F7	3185	E7	5109	D7	5123	E5	7105	B6	9104	E6	9119	G7		
2106	C5	2127	F9	2135	G11	2143	C10	2158	D10	3109	B7	3131	C6	3142	G10	3152	G9	3162	D9	3173	F7	3186	G8	5110	E9	6105	D4	7109	C6	9107	F11	9120	D10		

TUNER 95 bis Combi: Copper side view



IC 6105



Δ only in RDS version (04121)

○ not in RDS version (04341)

TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

LEU0149
9813

| | | |

ETF7 TAPE MODULE

(Non-Dolby Version)

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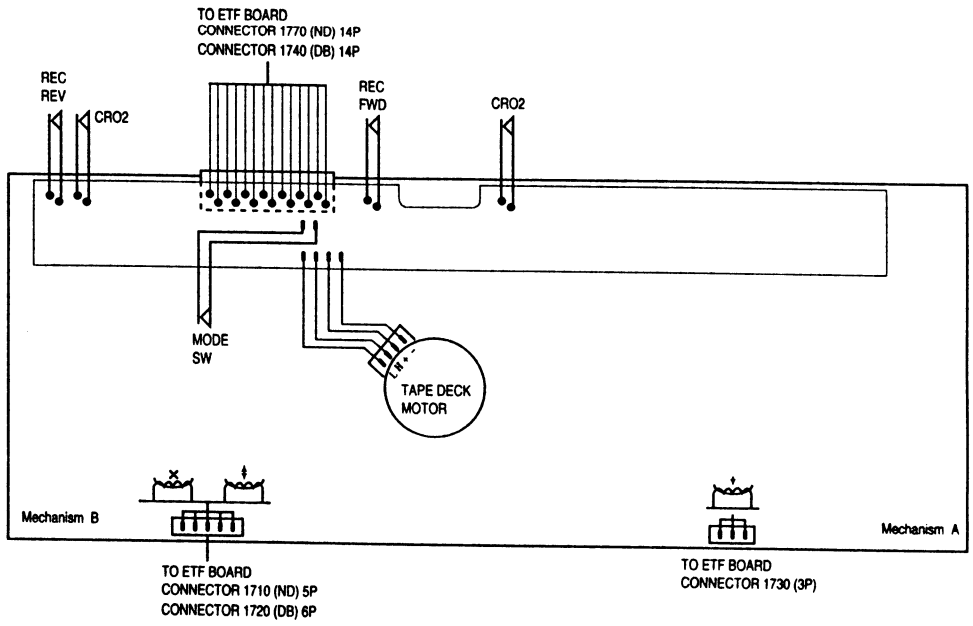
Tapedeck wiring (Double deck)



OPTIONS / VARIANTS TABLE

MODULE	ETF7		
VARIANT	1	2	3
FEATURES	DB/DD/FR	ND/DD/FR	ND/DD/FF
Deck configuration	double	double	double
Deck type (Tokyo Pigeon)	CWE	CWE	CWE
Autoreverse	yes (B)	yes (B)	no
Auto Replay	no	no	yes (A+B)
Motor configuration	single	single	single
Auto tape type selection	yes	yes	yes
Dolby type B Noise Reduction	yes	no	no
19 kHz pilot suppression	yes	no	no
Normal / High speed dubbing	yes	yes	no
Cue/Review & Fwd/Rewind	yes	yes	yes

DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

Variations table for Analog Circuit

	Autoreverse	Non-autoreverse
	ND/DD/FR	ND/DD/FF
2701 , 2702	150pF	270pF
2703 , 2704	100pF	220pF
2717 , 2718	10nF	15nF
2727 , 2728	470pF	1nF
3616	10k	1k
3618	6k8	-
3620	10k trimmer	-
3622	-	10k trimmer
3672	4k7	-
3676	47k	-
3688	680R	-
3723 , 3724	15k	18k
3727 , 3728	5k6	6k8
3729 , 3730	3k3	4k7
3743 , 3744	1k5	2k2
3745 , 3746	3k3	5k6
3754 , 3755	1M	47R
3769	12k	8k2
3772	6k8	5k6
3774	15k	8k2
6614	1N4148	-
7616	BC857B	-
7622	BC847B	-

PCS 103 373

ELECTRICAL PARTS LIST - TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 50V
2123	4822 121 10766	390pF 1% 630V
2125	4822 121 10578	560pF 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2139	4822 126 10002	100nF 20% 25V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	15pF 5% 50V
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
[illegible]	[illegible]	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3120	4822 051 20008	0R Jumper 0805
3123	4822 051 10008	0R Jumper 1206
3124	4822 051 10008	0R Jumper 1206
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R Jumper 1206
3131	4822 051 10008	0R Jumper 1206
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R Jumper 1206
3140	4822 051 20331	330R 5% 0,1W
3141	4822 117 11148	56k 1% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3147	4822 051 10008	0R Jumper 1206
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 117 13579	220k 1% 0,1W
3163	4822 051 10008	0R Jumper 1206
3164	4822 052 10478	⚠ 4R7 5% 0,33W
3165	4822 051 10008	0R Jumper 1206
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R Jumper 1206
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3178	4822 051 10008	0R Jumper 1206
3181	4822 051 10008	0R Jumper 1206
3183	4822 051 10008	0R Jumper 1206
3184	4822 051 10008	0R Jumper 1206
3185	4822 051 10008	0R Jumper 1206
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R Jumper 1206
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW Aerial
5103	4822 157 71635	LW Aerial

ELECTRICAL PARTS LIST - TUNER 95 BOARD

5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz
5114	4822 157 70302	AM_IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHZ
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

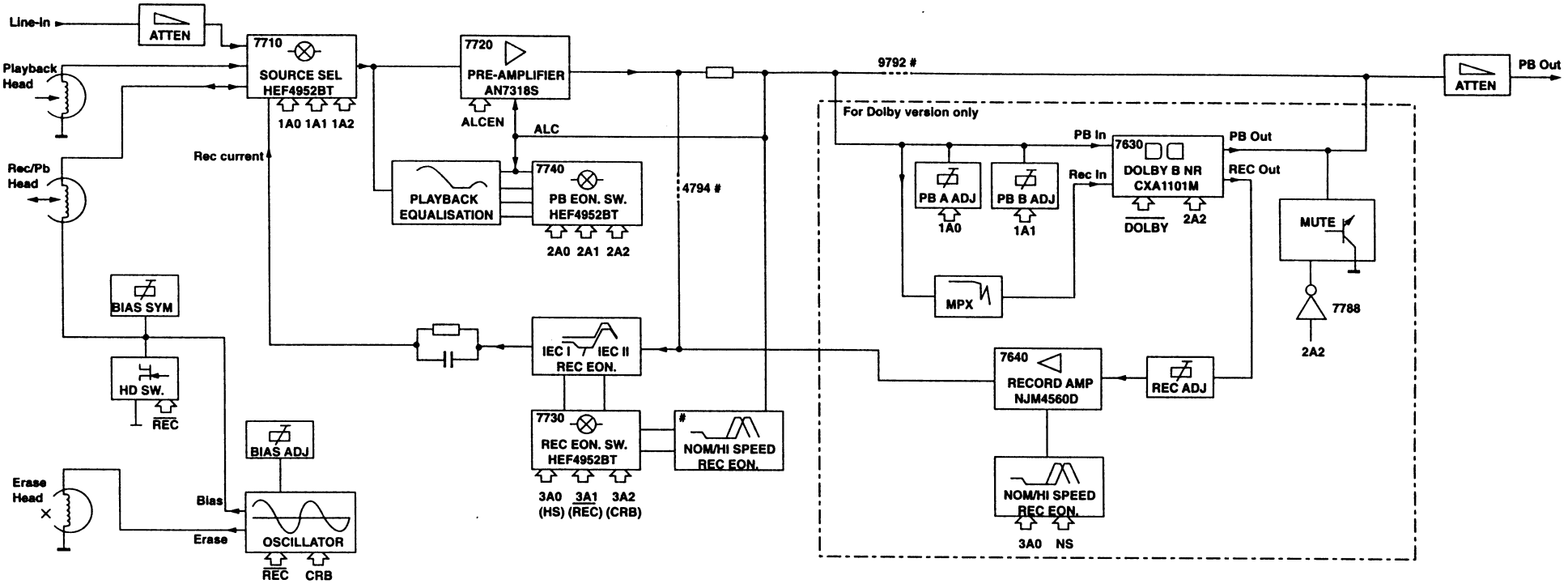
TRANSISTORS & INTEGRATED CIRCUITS

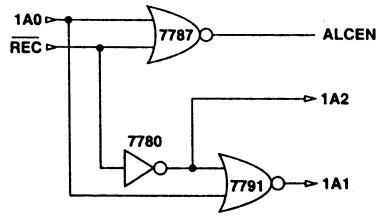
7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

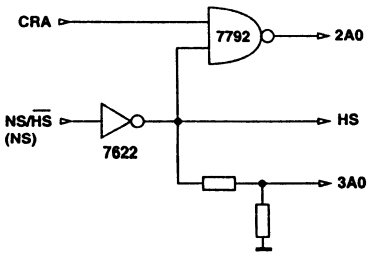
Note : Only the parts mentioned in this list are normal service spare parts.

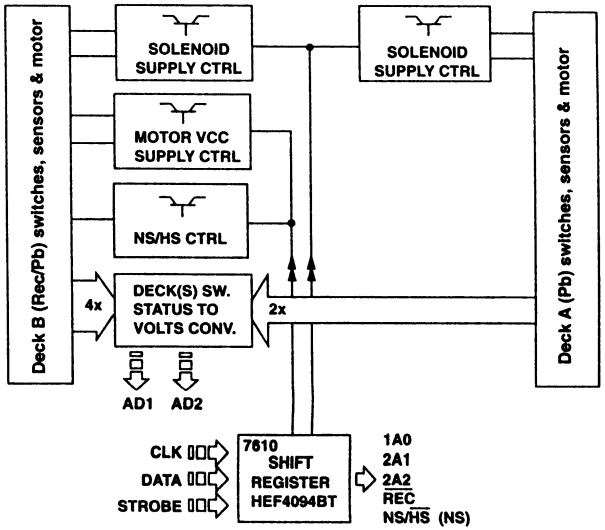
9-2

BLOCK DIAGRAM









NOTE: # For Non-dolby version only
Only 1 channel is presented.

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers

9-3

Brief Introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby version only)
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby B NR version only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR version only)

15. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non-Autoreverse
FR	Autoreverse Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

1	REC-L	Record input left
2	REC-R	Record input right
3	GND A	AF Ground
4	TAPE-L	Playback output left
5	+12V	D.C. supply (+12V) for AF electronics
6	TAPE-R	Playback output right
7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

1	GND M	Motor Ground
2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

1	AD2	Deck sensing switches output voltage / Deck A EOT
2	AD1	Deck sensing switches output voltage / Deck B EOT
3	+5V	DC supply +5V for ADC network
4	GND P	Control & Oscillator Ground
5	CLK	HEF4094BT shift register Clock line
6	DATA	HEF4094BT shift register Data line
7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON ***(For Non-Dolby version only)***

1	B R/P HD L+	R/P Head left channel positive
2	GND A	R/P Head return ground
3	B R/P HD R+	R/P Head right channel positive
4	ERASE HEAD	Erase Head
5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON ***(For Dolby B NR version only)***

1	B R/P HD L+	R/P Head left channel positive
2	B R/P HD L-	R/P Head left channel negative
3	B R/P HD R+	R/P Head right channel positive
4	B R/P HD R-	R/P Head right channel negative
5	ERASE HEAD	Erase Head
6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***

1	A PB HD L+	Pb Head left channel positive
2	GND A	Pb Head return ground shield
3	A PB HD R+	Pb Head right channel positive

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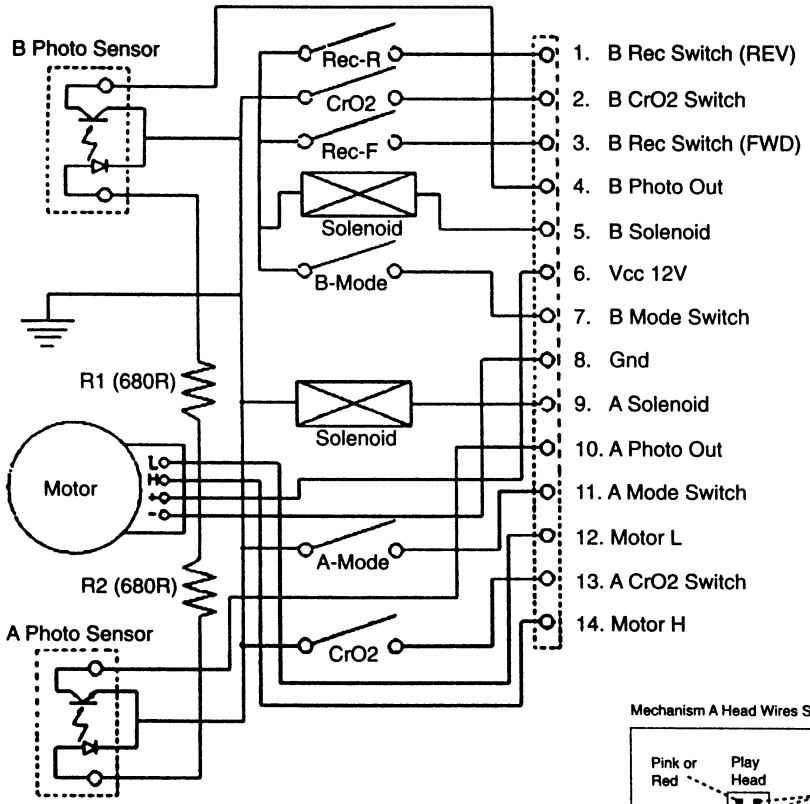
CONNECTOR 1740 — DECK A & B CONTROL INTERFACE ***(For Dolby B NR version only)***

1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

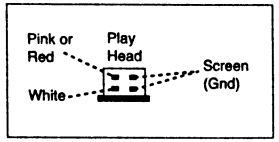
CONNECTOR 1770 — DECK A & B CONTROL INTERFACE ***(For Non-Dolby version only)***

1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

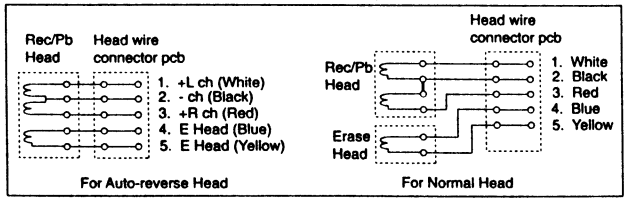
TAPE MECHANISM ELECTRONICS



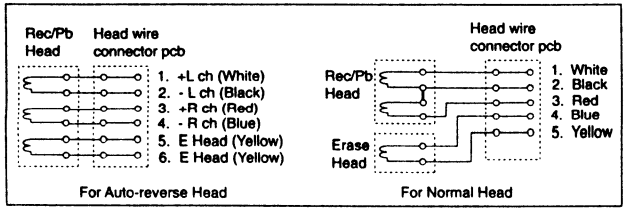
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)



TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	◇1 or ◇2 LEFT RIGHT	frequency counter	3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check	≤0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	THD-meter	check	≤3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

\# For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high, increase bias and re-meaure

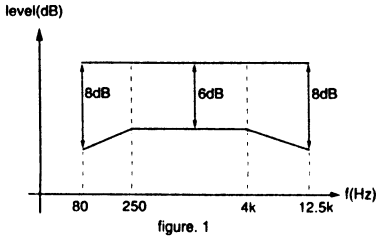


figure. 1

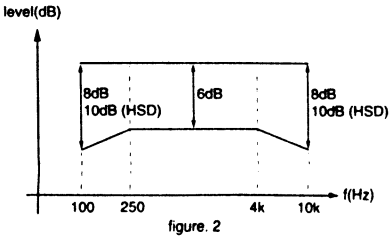
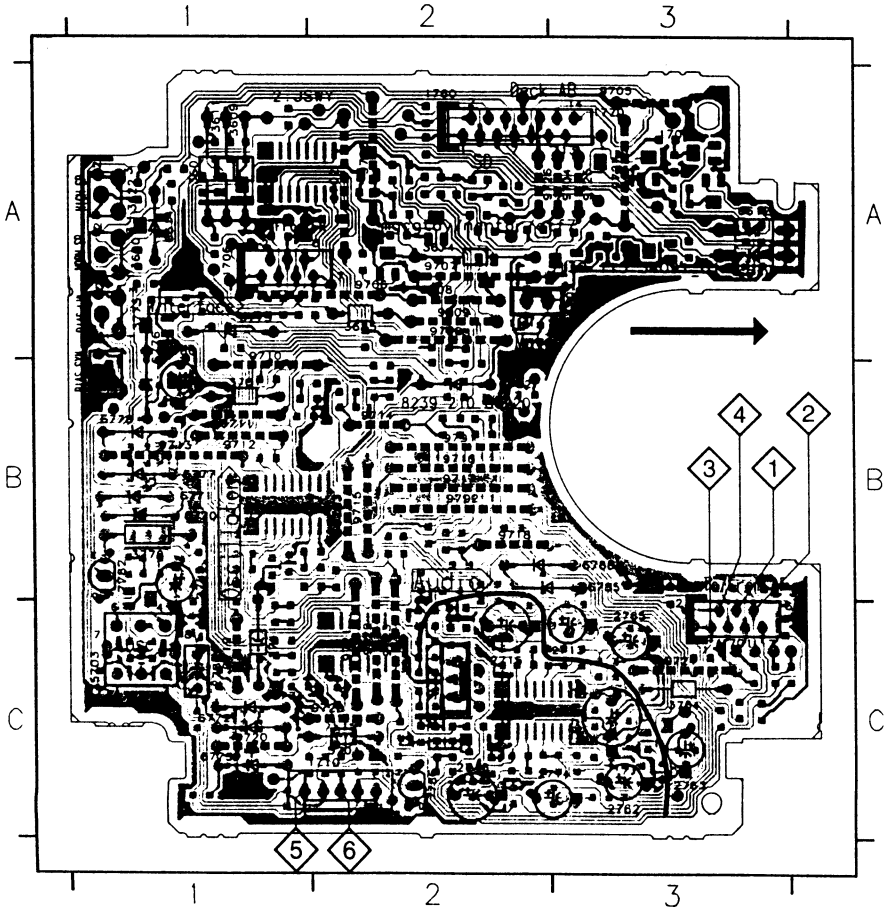


figure. 2

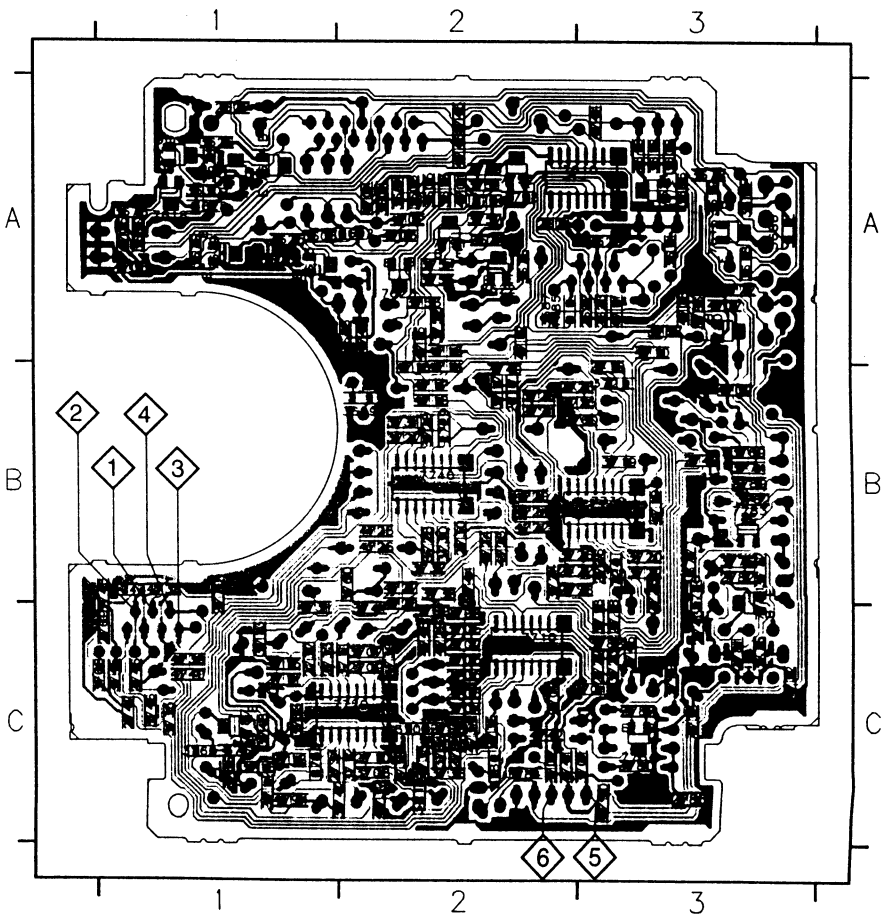
COMPONENT LAYOUT

1701 C3	2715 C2	3607 A1	3778 B1	6774 C1	9702 A2	9712 B1	9722 C2	9793 B2
1702 A3	2716 C2	3609 A1	5701 C2	6775 A1	9703 A2	9713 B1	9723 C2	
1703 A3	2741 C1	3611 A1	5703 C1	6776 A1	9704 A3	9714 B2	9724 C3	
1706 A1	2761 C3	3620 A1	6611 A3	6777 B1	9705 A3	9715 B2	9725 A3	
1710 C2	2762 C3	3622 A1	6612 A3	6778 B1	9706 A2	9716 B2	9726 A2	
1730 C2	2763 C3	3674 A2	6614 A1	6782 B2	9707 A2	9717 B2	9727 A3	
1760 A2	2765 C3	3685 A2	6770 B1	6785 B3	9708 A2	9718 B2	9728 A2	
1770 A3	2780 A1	3761 B1	6771 B1	6786 B3	9709 A2	9719 C1	9729 C2	
2713 C3	2784 C1	3764 C3	6772 C1	7782 B1	9710 A1	9720 C1	9791 B2	
2714 C3	2785 B1	3773 A1	6773 C1	7786 C2	9711 B1	9721 C2	9792 B2	



CHIP LAYOUT

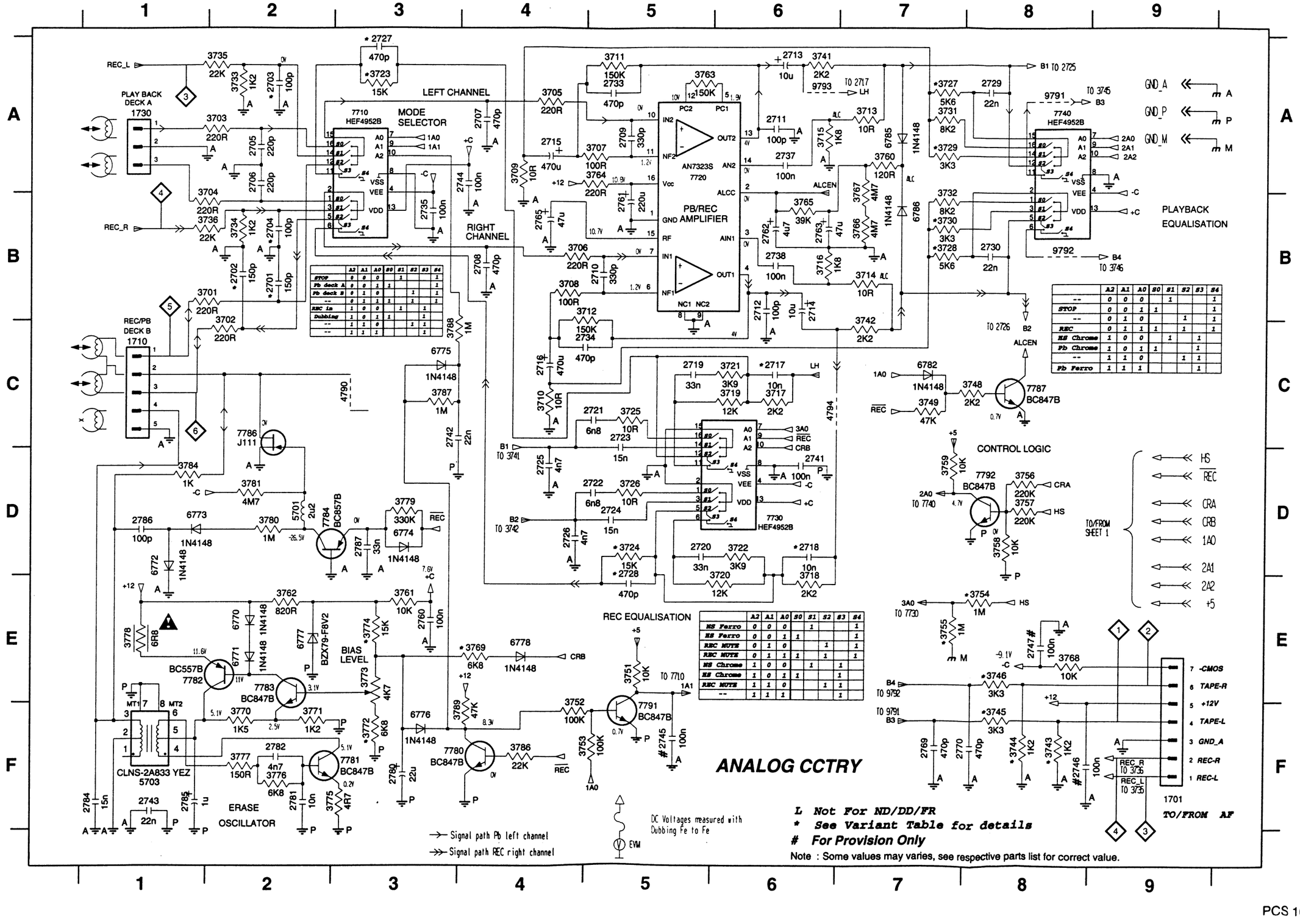
2621 A2	2724 B3	3602 A2	3688 A3	3725 B2	3757 A2	4701 A2	4727 B2	7612 A1	
2622 A3	2725 B3	3603 A2	3689 B2	3726 B2	3758 A2	4702 A2	4728 C2	7613 A1	
2623 A3	2726 B3	3604 A2	3701 C3	3727 B2	3759 A2	4703 A2	4729 C2	7614 A1	
2624 A2	2727 C3	3605 A2	3702 C2	3728 B2	3760 B2	4704 A2	4730 C2	7616 A3	
2625 A3	2728 B2	3606 A1	3703 C2	3729 B2	3762 B3	4705 A1	4731 C1	7618 A1	
2626 A2	2729 B2	3608 A3	3704 C2	3730 B2	3763 C1	4706 A1	4732 C3	7619 A1	
2627 A1	2730 B2	3610 A3	3705 C2	3731 B2	3765 C1	4707 A3	4733 C3	7620 A1	
2701 C3	2733 C1	3612 A3	3706 C2	3732 B2	3766 C1	4708 A3	4734 C2	7622 A2	
2702 C2	2734 C1	3613 A2	3707 C2	3733 B2	3767 C1	4709 B3	4735 C2	7623 A2	
2703 C2	2735 C2	3614 A3	3708 C2	3734 C2	3768 C1	4710 A3	4736 C2	7624 A3	
2704 C2	2737 C1	3616 A3	3709 C2	3735 C1	3769 B3	4711 A3	4737 C2	7710 C2	
2705 C2	2738 C1	3618 A3	3710 C2	3736 C2	3770 B3	4712 A2	4738 B1	7720 C2	
2706 C2	2742 B3	3619 A3	3711 C2	3741 C2	3771 B3	4713 A2	4739 C1	7730 B3	
2707 C2	2743 C3	3623 A1	3712 C2	3742 C1	3772 A3	4714 B2	4740 C1	7740 B2	
2708 C2	2744 B2	3624 A1	3713 C1	3743 B1	3774 B3	4715 A2	4741 C2	7780 A3	
2709 C2	2745 C3	3625 A1	3714 C1	3744 B1	3775 C3	4716 B2	4742 C2	7781 B3	
2710 C2	2746 C1	3626 A1	3715 C1	3745 C1	3776 B3	4717 B2	4744 A3	7783 B3	
2711 C1	2747 C1	3628 A1	3716 C1	3746 C1	3777 B3	4718 B2	4745 A2	7784 C3	
2712 C1	2760 B3	3630 A1	3717 B2	3748 C1	3779 C3	4719 B3	4746 A2	7787 C1	
2717 B2	2769 C1	3672 A3	3718 C3	3749 B2	3780 C3	4720 B2	4747 A2	7791 A2	
2718 C3	2770 B1	3676 A2	3719 B3	3751 A2	3781 C2	4721 B2	4748 C2	7792 A2	
2719 B3	2781 C3	3678 A1	3720 B3	3752 A2	3784 C2	4722 B2	4785 A2		
2720 B3	2782 B3	3679 A1	3721 B3	3753 A2	3786 A3	4723 B2	4790 C3		
2721 B2	2786 C3	3680 A1	3722 B3	3754 A2	3787 A3	4724 B2	4794 C1		
2722 B2	2787 C3	3686 A3	3723 C3	3755 A2	3788 C3	4725 B2	4795 B2		
2723 B2	3601 A2	3687 A2	3724 B2	3756 A2	3789 B3	4726 B2	7610 A3		



9-7

ANALOG CIRCUIT

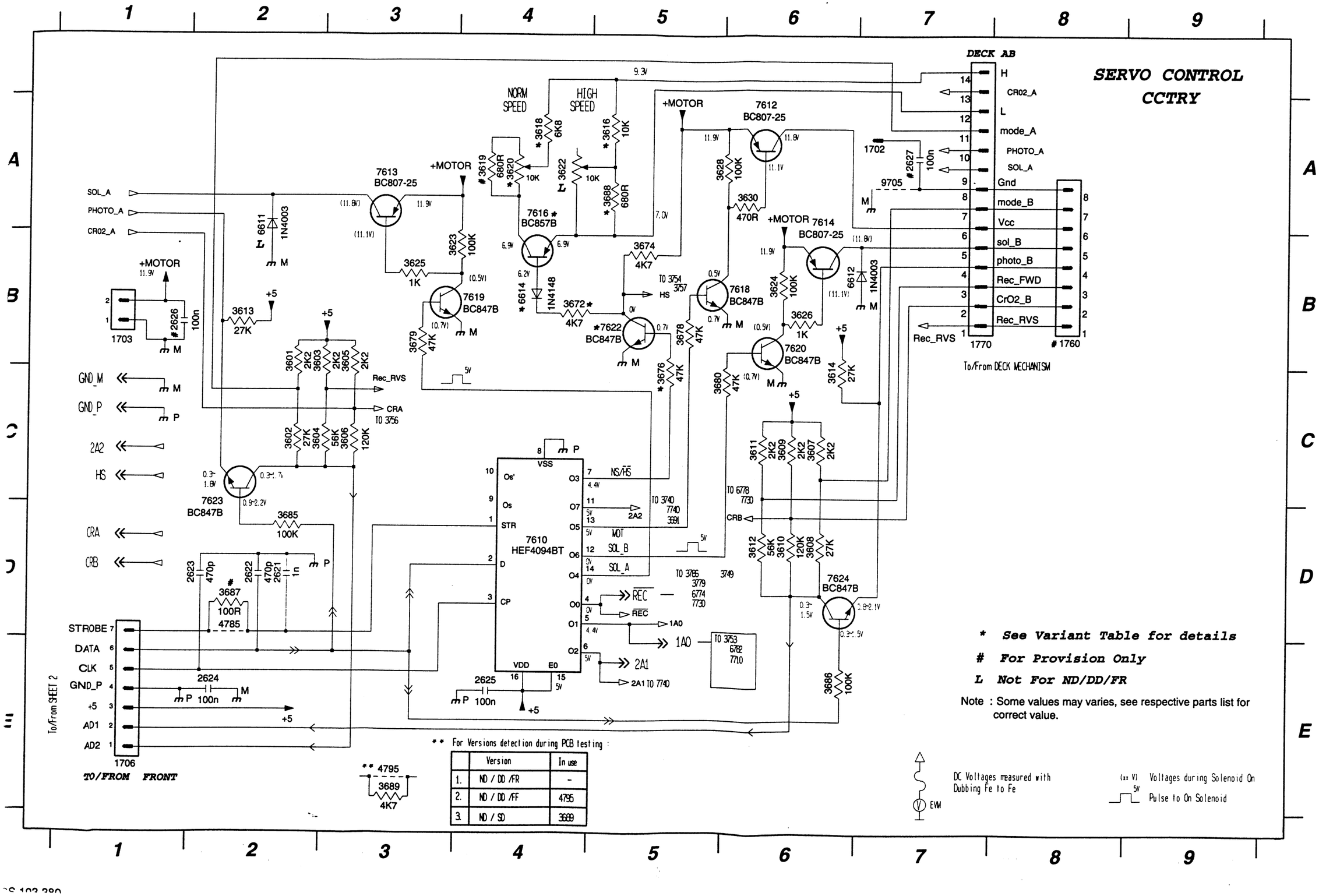
1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	7710 A3	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	7720 A5	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7	3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	

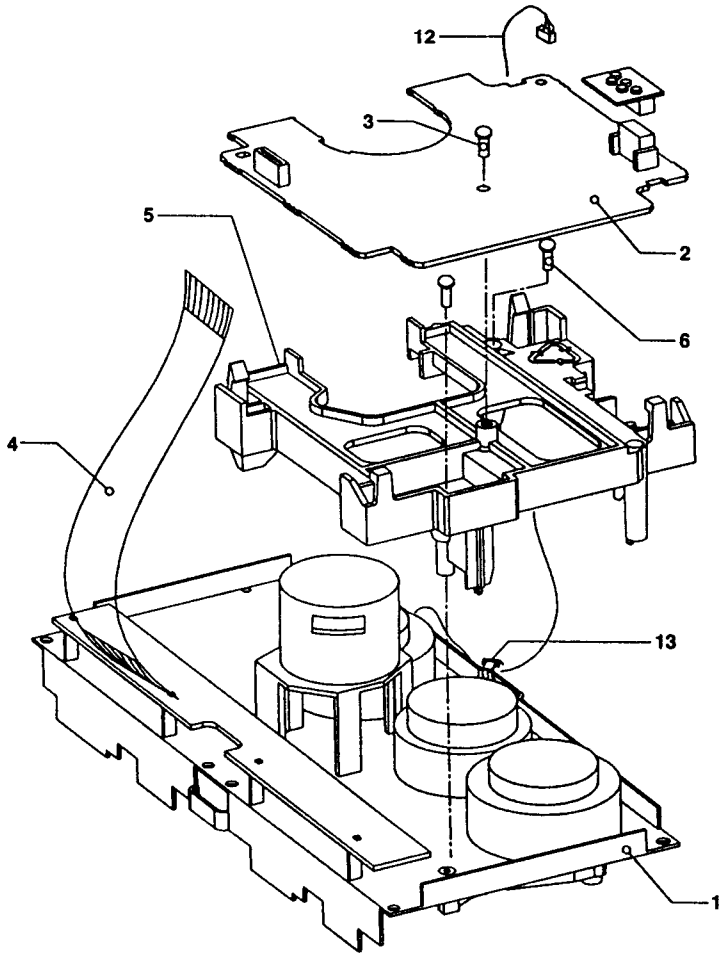


9-8

SERVO CONTROL CIRCUIT

1702 A7 1760 B8 2622 D2 2625 E4 3601 B2 3604 C2 3607 C6 3610 D6 3613 B2 3618 A4 3622 A4 3625 B3 3630 A6 3676 C5 3680 C5 3687 D2 4785 D2 6612 B6 7612 A6 7616 A4 7620 B6 7624 D6
1703 B1 1770 B7 2623 D2 2626 B1 3602 C2 3605 B3 3608 D6 3611 C6 3614 C6 3619 A4 3623 B3 3626 B6 3672 B4 3678 B5 3685 D2 3688 A5 4795 E3 6614 B4 7613 A3 7618 B6 7622 B5 9705 A7
1706 E1 2621 D2 2624 E2 2627 A7 3603 B2 3606 C3 3609 C6 3612 D6 3616 A5 3620 A4 3624 B6 3628 A5 3674 B5 3679 B3 3686 E6 3689 E3 6611 A2 7610 D4 7614 A6 7619 B4 7623 D2





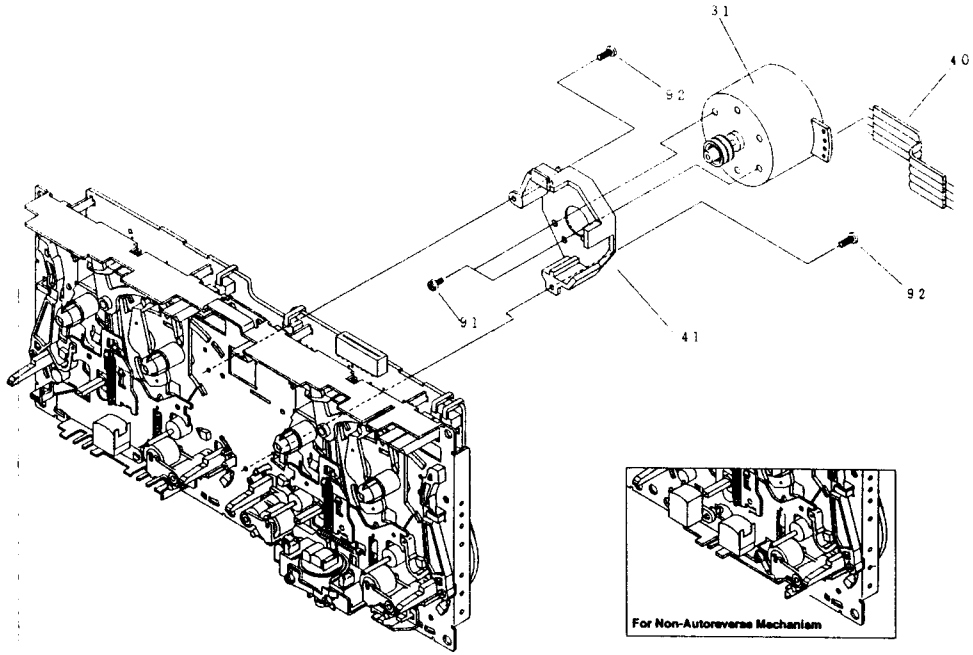
3139 118 77070 (incl. ...77080) dd wk926

TAPE MODULE EXPLODED VIEW

1	313911877130	Autoreverse Mech. CWE44FR01
1	313911877140	Non-Autoreverse Mech. CWE44FF02
3	-	Screw D3 x 10
6	-	Screw M2 x 16
7	313911034080	Flex Cable 14 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.

9-9



TAPE MECHANISM - MOTOR EXPLODED VIEW

31	4822 361 11055	Motor Assembly
91	-	Screw M2,6 x 5
92	-	Screw M2 x 5

Note: Only the parts mentioned in this list are normal service spare parts.

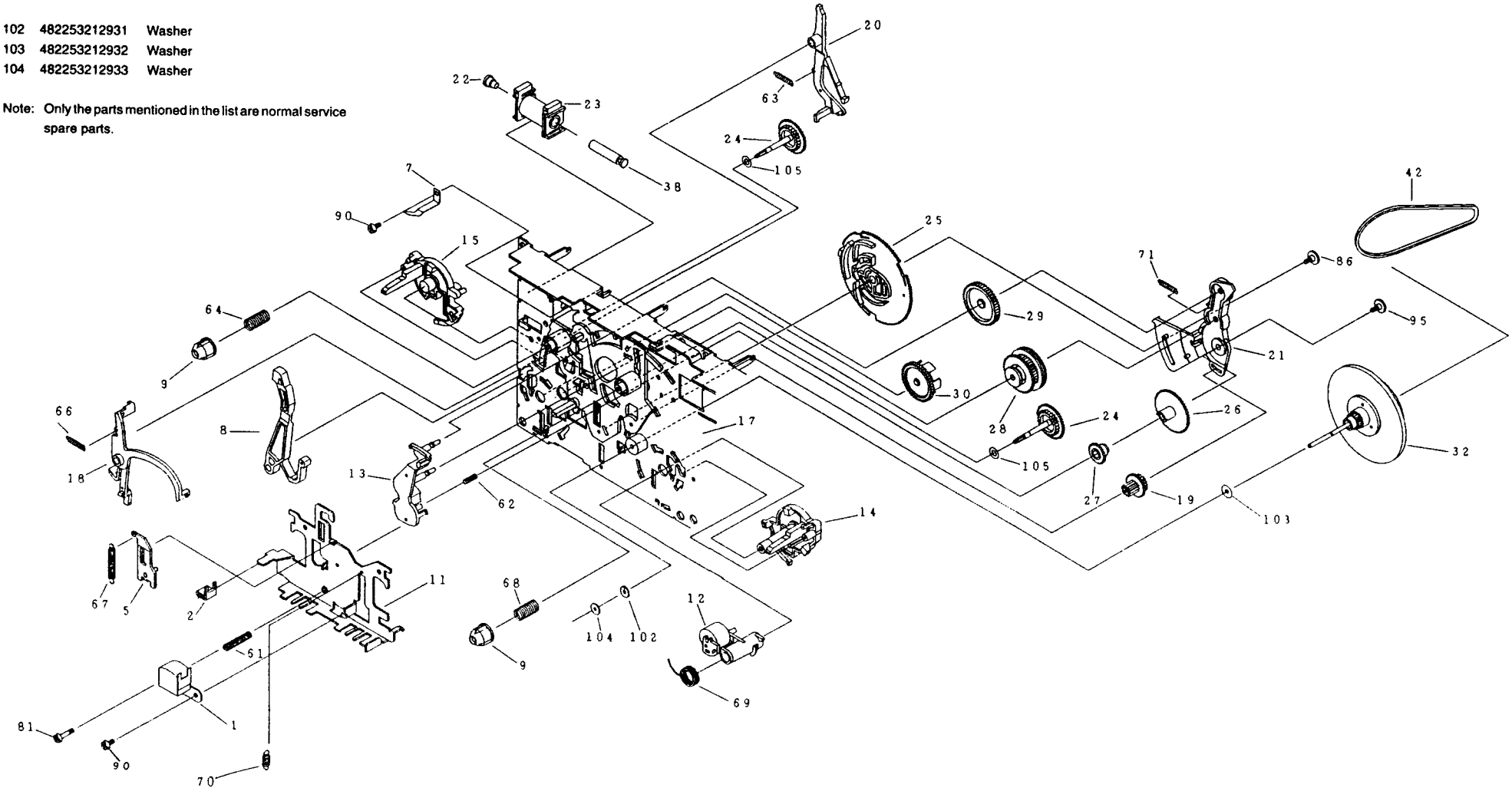
9-10

TAPE MECHANISM A - PLAY

MECHANICAL PARTS - PLAY MECHANISM

1	996500002313	Play Head (Non-Autoreverse deck)
1	996500002321	Play Head (Autoreverse deck)
12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
42	996500002315	Belt AF (Autoreverse deck)
42	996500002718	Belt AF (Non-autoreverse deck)
69	482249211761	Spring
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



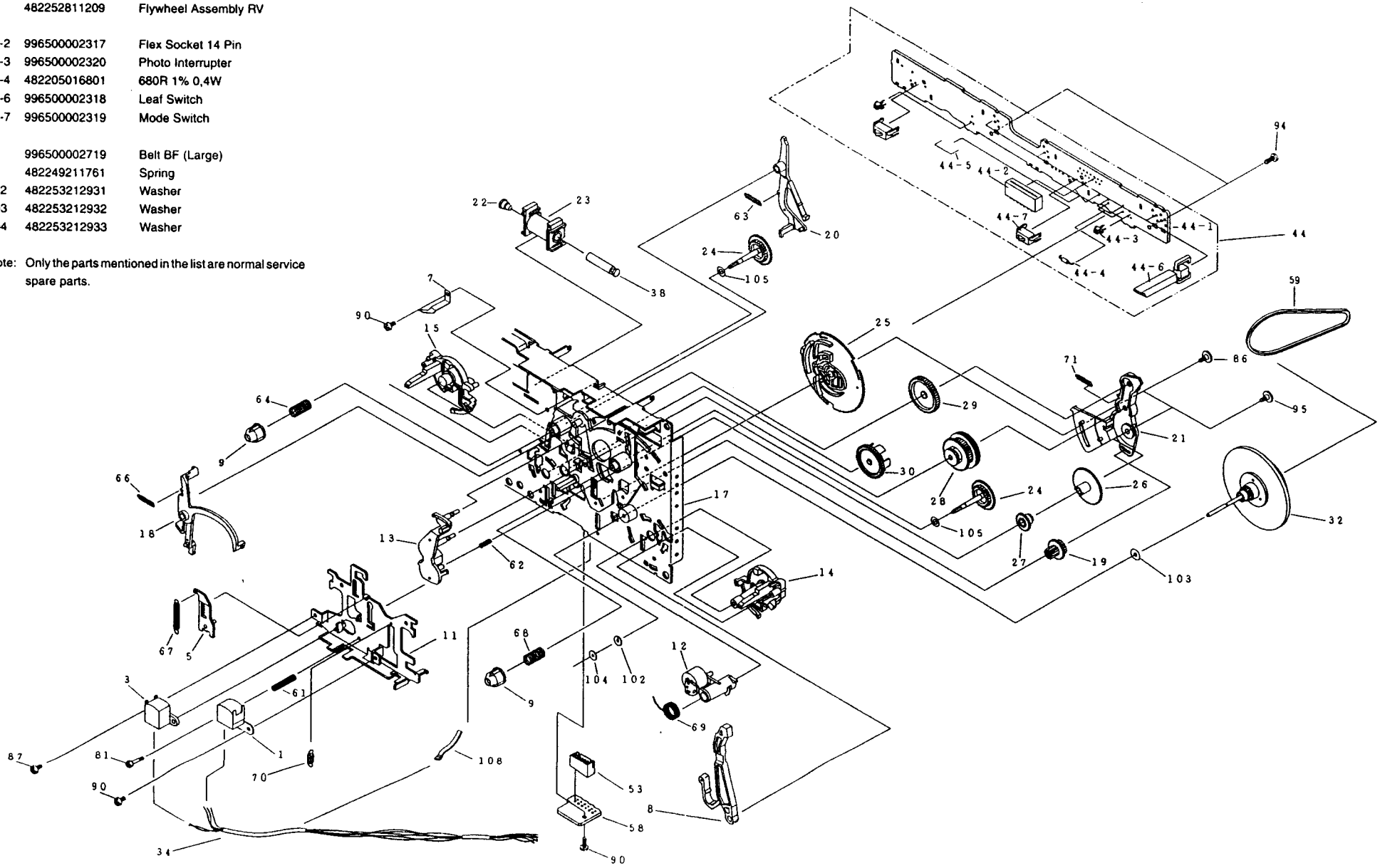
9-11

TAPE MECHANISM B - RECORD/PLAYBACK *(Non-Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

1	996500002313	Play Head
3	996500002600	Head, Erase
12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
44-2	996500002317	Flex Socket 14 Pin
44-3	996500002320	Photo Interrupter
44-4	482205016801	680R 1% 0,4W
44-6	996500002318	Leaf Switch
44-7	996500002319	Mode Switch
59	996500002719	Belt BF (Large)
69	482249211761	Spring
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



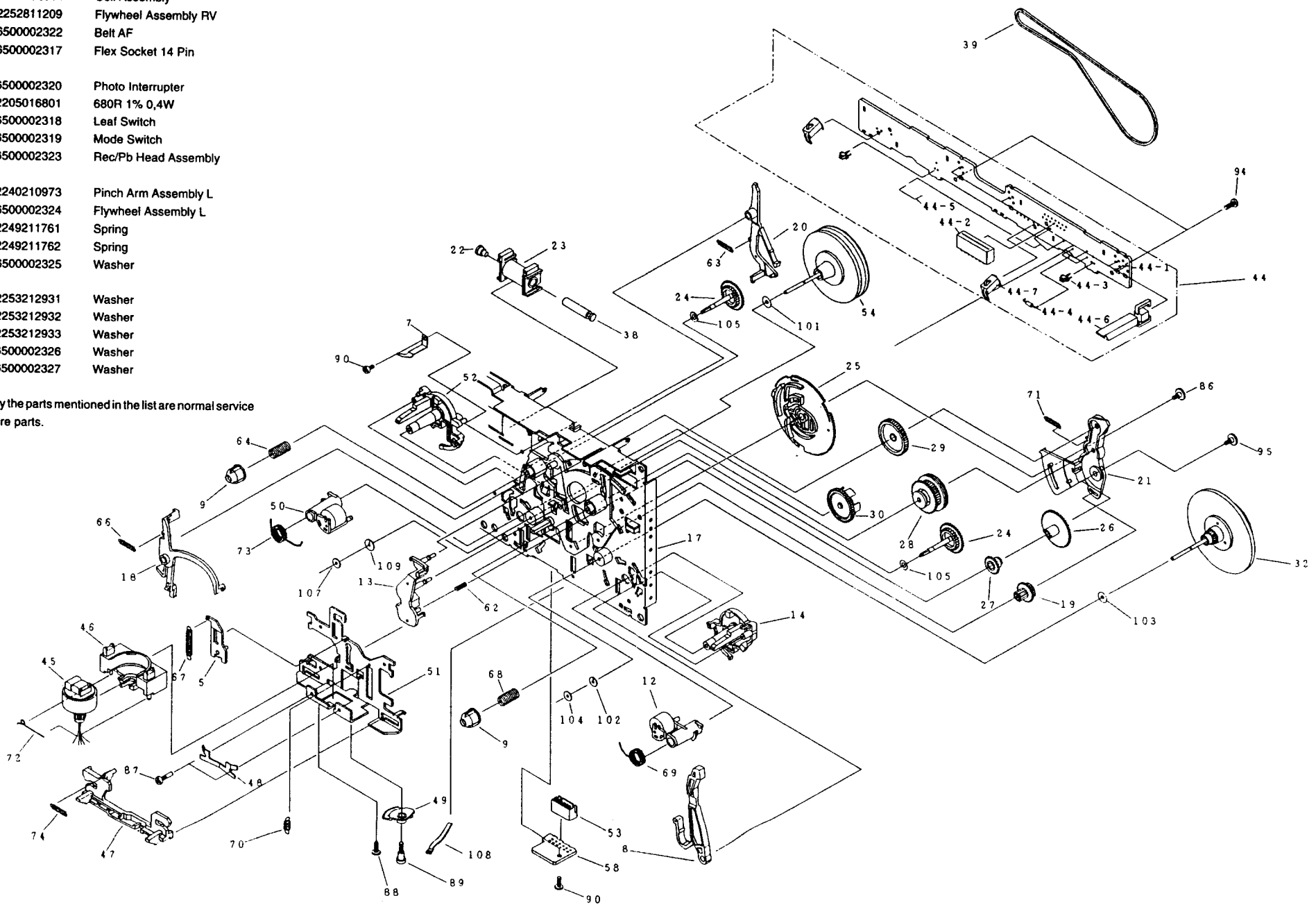
9-12

TAPE MECHANISM B - RECORD/PLAYBACK *(Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
39	996500002322	Belt AF
44-2	996500002317	Flex Socket 14 Pin
44-3	996500002320	Photo Interrupter
44-4	482205016801	680R 1% 0,4W
44-6	996500002318	Leaf Switch
44-7	996500002319	Mode Switch
45	996500002323	Rec/Pb Head Assembly
50	482240210973	Pinch Arm Assembly L
54	996500002324	Flywheel Assembly L
69	482249211761	Spring
73	482249211762	Spring
101	996500002325	Washer
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer
107	996500002326	Washer
109	996500002327	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

MISCELLANEOUS

1701	482226710953	Flex Socket 7pin Vert.
1706	482226710953	Flex Socket 7pin Vert.
1770	482226751255	Flex Socket 14pin Vert.

CAPACITORS

2621	532212231647	1nF 10% 63V
2622	532212234099	470pF 10% 63V
2623	532212234099	470pF 10% 63V
2624	482212614585	100nF 10% 50V
2625	482212614585	100nF 10% 50V
2701	532212233538	150pF 2% 63V Autoreverse
2701	482212233216	270pF 5% 63V Non-autoreverse
2702	532212233538	150pF 2% 63V Autoreverse
2702	482212233216	270pF 5% 63V Non-autoreverse
2703	532212232531	100pF 5% 50V Autoreverse
2703	482212233575	220pF 5% 63V Non-autoreverse
2704	532212232531	100pF 5% 50V Autoreverse
2704	482212233575	220pF 5% 63V Non-autoreverse
2705	482212233575	220pF 5% 63V
2706	482212233575	220pF 5% 63V
2707	532212234099	470pF 10% 63V
2708	532212234099	470pF 10% 63V
2709	532212231863	330pF 5% 63V
2710	532212231863	330pF 5% 63V
2711	532212232531	100pF 5% 50V
2712	532212232531	100pF 5% 50V
2713	482212440248	10µF 20% 63V
2714	482212440248	10µF 20% 63V
2715	482212480195	470µF 20% 10V
2716	482212480195	470µF 20% 10V
2717	482212233177	10nF 20% 50V Autoreverse
2717	482212613188	15nF 5% 63V Non-autoreverse
2718	482212233177	10nF 20% 50V Autoreverse
2718	482212613188	15nF 5% 63V Non-autoreverse
2719	482212612105	33nF 5% 50V
2720	482212612105	33nF 5% 50V
2721	532212231866	6,8nF 10% 63V
2722	532212231866	6,8nF 10% 63V
2723	482212613188	15nF 5% 63V
2724	482212613188	15nF 5% 63V
2725	532212610223	4,7nF 10% 63V
2726	532212610223	4,7nF 10% 63V
2727	532212234099	470pF 10% 63V Autoreverse
2727	532212231647	1nF 10% 63V Non-autoreverse
2728	532212234099	470pF 10% 63V Autoreverse
2728	532212231647	1nF 10% 63V Non-autoreverse
2729	532212232654	22nF 10% 63V
2730	532212232654	22nF 10% 63V
2733	532212234099	470pF 10% 63V
2734	532212234099	470pF 10% 63V
2735	482212614585	100nF 10% 50V
2737	482212614585	100nF 10% 50V
2738	482212614585	100nF 10% 50V
2741	482212611585	22nF +80/-20% 25V
2742	532212232654	22nF 10% 63V
2743	532212232654	22nF 10% 63V
2744	482212614585	100nF 10% 50V
2760	482212614585	100nF 10% 50V
2761	482212480144	220µF 20% 25V
2762	482212440769	4,7µF 20% 100V
2763	482212440433	47µF 20% 25V
2765	482212440433	47µF 20% 25V
2769	532212234099	470pF 10% 63V
2770	532212234099	470pF 10% 63V
2780	482212481151	22µF 20% 50V
2781	482212233177	10nF 20% 50V
2782	532212610223	4,7nF 10% 63V
2784	482212151305	15nF 10% 50V
2785	482212421913	1µF 20% 63V
2786	532212232531	100pF 5% 50V
2787	482212612105	33nF 5% 50V

RESISTORS

3601	482211711449	2k2 1% 0,1W
3602	482205120273	27k 5% 0,1W
3603	482211711449	2k2 1% 0,1W
3604	482211711148	56k 1% 0,1W
3605	482211711449	2k2 1% 0,1W
3606	482205120124	120k 5% 0,1W
3607	482211652256	2k2 5% 0,5W
3608	482205120273	27k 5% 0,1W
3609	482211652256	2k2 5% 0,5W
3610	482205120124	120k 5% 0,1W
3611	482211652256	2k2 5% 0,5W
3612	482211711148	56k 1% 0,1W
3613	482205120273	27k 5% 0,1W
3614	482205120273	27k 5% 0,1W
3616	482211710833	10k 1% 0,1W Autoreverse
3616	482205110102	1k 2% 0,25W Non-autoreverse
3618	482211711507	6k8 1% 0,1W Autoreverse
3620	482210011141	Trimmer 10k 30% 0,1W Autorev.
3622	482210011141	Trimmer 10k 30% 0,1W Non-autorev.
3623	482211710837	100k 1% 0,1W
3624	482211710837	100k 1% 0,1W
3625	482205110102	1k 2% 0,25W
3626	482205110102	1k 2% 0,25W
3628	482211710837	100k 1% 0,1W
3630	482205120471	470R 5% 0,1W
3672	482205120472	4k7 5% 0,1W Autoreverse
3674	482211652283	4k7 5% 0,5W
3676	482211710834	47k 1% 0,1W Autoreverse
3678	482211710834	47k 1% 0,1W
3679	482211710834	47k 1% 0,1W
3680	482211710834	47k 1% 0,1W

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ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

3685	482211652234	100k 5% 0,5W	
3686	482211710837	100k 1% 0,1W	
3688	482211710361	680R 1% 0,1W	Autoreverse
3701	482211711503	220R 1% 0,1W	
3702	482211711503	220R 1% 0,1W	
3703	482211711503	220R 1% 0,1W	
3704	482211711503	220R 1% 0,1W	
3705	482211711503	220R 1% 0,1W	
3706	482211711503	220R 1% 0,1W	
3707	482205120101	100R 5% 0,1W	
3708	482205120101	100R 5% 0,1W	
3709	482205120109	10R 5% 0,1W	
3710	482205120109	10R 5% 0,1W	
3711	482205120154	150k 5% 0,1W	
3712	482205120154	150k 5% 0,1W	
3713	482205120109	10R 5% 0,1W	
3714	482205120109	10R 5% 0,1W	
3715	482205120182	1k8 5% 0,1W	
3716	482205120182	1k8 5% 0,1W	
3717	482211711449	2k2 1% 0,1W	
3718	482211711449	2k2 1% 0,1W	
3719	482211711383	12k 1% 0,1W	
3720	482211711383	12k 1% 0,1W	
3721	482205120392	3k9 5% 0,1W	
3722	482205120392	3k9 5% 0,1W	
3723	482211683933	15k 1% 0,1W	Autoreverse
3723	482211710965	18k 1% 0,1W	Non-autoreverse
3724	482211683933	15k 1% 0,1W	Autoreverse
3724	482211710965	18k 1% 0,1W	Non-autoreverse
3725	482205120109	10R 5% 0,1W	
3726	482205120109	10R 5% 0,1W	
3727	482205120562	5k6 5% 0,1W	Autoreverse
3727	482211711507	6k8 1% 0,1W	Non-autoreverse
3728	482205120562	5k6 5% 0,1W	Autoreverse
3728	482211711507	6k8 1% 0,1W	Non-autoreverse
3729	482205120332	3k3 5% 0,1W	Autoreverse
3729	482205120472	4k7 5% 0,1W	Non-autoreverse
3730	482205120332	3k3 5% 0,1W	Autoreverse
3730	482205120472	4k7 5% 0,1W	Non-autoreverse
3731	482205120822	8k2 5% 0,1W	
3732	482205120822	8k2 5% 0,1W	
3733	482205120122	1k2 5% 0,1W	
3734	482205120122	1k2 5% 0,1W	
3735	482205120223	22k 5% 0,1W	
3736	482205120223	22k 5% 0,1W	
3741	482211711449	2k2 1% 0,1W	
3742	482211711449	2k2 1% 0,1W	
3743	482211711139	1k5 1% 0,1W	Autoreverse
3743	482211711449	2k2 1% 0,1W	Non-autoreverse
3744	482211711139	1k5 1% 0,1W	Autoreverse
3744	482211711449	2k2 1% 0,1W	Non-autoreverse
3745	482205120332	3k3 5% 0,1W	Autoreverse
3745	482205120562	5k6 5% 0,1W	Non-autoreverse
3746	482205120332	3k3 5% 0,1W	Autoreverse
3746	482205120562	5k6 5% 0,1W	Non-autoreverse
3748	482211711449	2k2 1% 0,1W	
3749	482211710834	47k 1% 0,1W	
3751	482211710833	10k 1% 0,1W	
3752	482211710837	100k 1% 0,1W	
3753	482211710837	100k 1% 0,1W	
3754	482205120105	1M 5% 0,1W	Autoreverse
3754	482205120479	47R 5% 0,1W	Non-autoreverse
3755	482205120105	1M 5% 0,1W	Autoreverse
3755	482205120479	47R 5% 0,1W	Non-autoreverse
3756	482211713579	220k 1% 0,1W	
3757	482211713579	220k 1% 0,1W	
3758	482211710833	10k 1% 0,1W	
3759	482211710833	10k 1% 0,1W	
3760	482205120121	120R 5% 0,1W	
3761	482205021003	10k 1% 0,6W	
3762	482211711454	820R 1% 0,1W	
3763	482205120154	150k 5% 0,1W	
3764	482211683872	220R 5% 0,5W	
3765	482205120393	39k 5% 0,1W	
3766	482205120475	4M7 5% 0,1W	
3767	482205120475	4M7 5% 0,1W	
3768	482211710833	10k 1% 0,1W	
3769	482211711383	12k 1% 0,1W	Autoreverse
3769	482205120822	8k2 5% 0,1W	Non-autoreverse
3770	482211711139	1k5 1% 0,1W	
3771	482205120122	1k2 5% 0,1W	
3772	482211711507	6k8 1% 0,1W	Autoreverse
3772	482205120562	5k6 5% 0,1W	Non-autoreverse
3773	482210012227	Trimmer 4k7 30% 0,1W	
3774	482211683933	15k 1% 0,1W	Autoreverse
3774	482205120822	8k2 5% 0,1W	Non-autoreverse
3775	482205120478	4R7 5% 0,1W	
3776	482211711507	6k8 1% 0,1W	
3777	482211710353	150R 1% 0,1W	
3778	482205210688	Δ 6R8 5% 0,33W	
3779	482205120334	330k 5% 0,1W	
3780	482205120105	1M 5% 0,1W	
3781	482205120475	4M7 5% 0,1W	
3784	482205110102	1k 2% 0,25W	
3786	482205120223	22k 5% 0,1W	
3787	482205120105	1M 5% 0,1W	
3788	482205120105	1M 5% 0,1W	
3789	482211710834	47k 1% 0,1W	
4701	482205120008	0R Jumper 0805	
4702	482205120008	0R Jumper 0805	
4703	482205120008	0R Jumper 0805	
4704	482205120008	0R Jumper 0805	
4705	482205120008	0R Jumper 0805	
4706	482205120008	0R Jumper 0805	

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

RESISTORS

4707	482205120008	0R Jumper 0805
4708	482205120008	0R Jumper 0805
4709	482205120008	0R Jumper 0805
4710	482205120008	0R Jumper 0805
4711	482205120008	0R Jumper 0805
4712	482205120008	0R Jumper 0805
4713	482205120008	0R Jumper 0805
4714	482205120008	0R Jumper 0805
4715	482205120008	0R Jumper 0805
4716	482205120008	0R Jumper 0805
4717	482205120008	0R Jumper 0805
4718	482205120008	0R Jumper 0805
4719	482205120008	0R Jumper 0805
4720	482205120008	0R Jumper 0805
4721	482205120008	0R Jumper 0805
4722	482205120008	0R Jumper 0805
4723	482205120008	0R Jumper 0805
4724	482205120008	0R Jumper 0805
4725	482205120008	0R Jumper 0805
4726	482205120008	0R Jumper 0805
4727	482205120008	0R Jumper 0805
4728	482205120008	0R Jumper 0805
4729	482205120008	0R Jumper 0805
4730	482205120008	0R Jumper 0805
4731	482205120008	0R Jumper 0805
4732	482205120008	0R Jumper 0805
4733	482205120008	0R Jumper 0805
4734	482205120008	0R Jumper 0805
4735	482205120008	0R Jumper 0805
4736	482205120008	0R Jumper 0805
4737	482205120008	0R Jumper 0805
4738	482205120008	0R Jumper 0805
4739	482205120008	0R Jumper 0805
4740	482205120008	0R Jumper 0805
4741	482205120008	0R Jumper 0805
4742	482205120008	0R Jumper 0805
4744	482205120008	0R Jumper 0805
4745	482205120008	0R Jumper 0805
4746	482205120008	0R Jumper 0805
4748	482205120008	0R Jumper 0805
4785	482205120008	0R Jumper 0805
4790	482205120008	0R Jumper 0805
4794	482205120008	0R Jumper 0805
4795	482205120008	0R Jumper 0805

COILS & FILTERS

5701	482215711477	Coil 2,2µH 5%
5703	482215620946	Osc Coil 100kHz

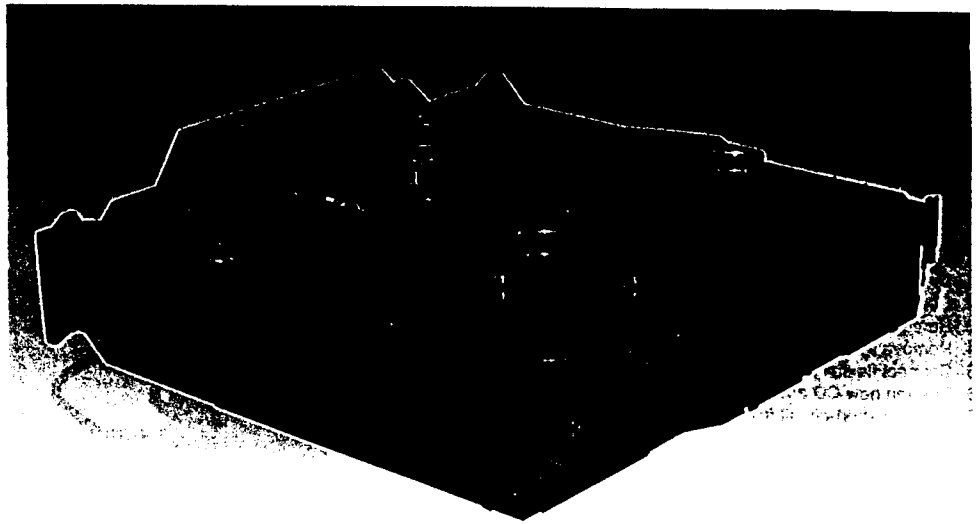
DIODES

6611	482213031878	1N4003G
6612	482213031878	1N4003G
6614	482213030621	1N4148 Autoreverse
6770	482213030621	1N4148
6771	482213030621	1N4148
6772	482213030621	1N4148
6773	482213030621	1N4148
6774	482213030621	1N4148
6775	482213030621	1N4148
6776	482213030621	1N4148
6777	482213034382	BZX79-F8V2
6778	482213030621	1N4148
6782	482213030621	1N4148
6785	482213030621	1N4148
6786	482213030621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT
7612	532213060845	BC807-25
7613	532213060845	BC807-25
7614	532213060845	BC807-25
7616	482213060373	BC857B Autoreverse
7618	482213060511	BC847B
7619	482213060511	BC847B
7620	482213060511	BC847B
7622	482213060511	BC847B Autoreverse
7623	482213060511	BC847B
7624	482213060511	BC847B
7710	482220932919	HEF4952BT
7720	932214000668	AN7323S
7730	482220932919	HEF4952BT
7740	482220932919	HEF4952BT
7780	482213060511	BC847B
7781	482213042804	BC817-25
7782	482213044568	BC557B
7783	482213060511	BC847B
7784	482213060373	BC857B
7786	482213063494	J111
7787	482213060511	BC847B
7791	482213060511	BC847B
7792	482213060511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.



3CDC-LC

(3 Disc Carrousel Changer)

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ReWritable COMPACT disc DIGITAL AUDIO

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CD mechanism:
1. Disconnect CD drive flexfoil from old CD drive
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Remove old CD drive
4. Remove short-circuit from flexfoil
5. Connect flexfoil to new CD drive
6. Position new CD drive in its studs
7. Remove short-circuit from Laserunit

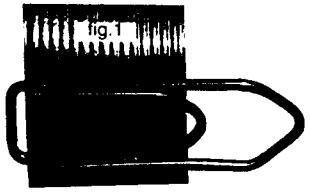
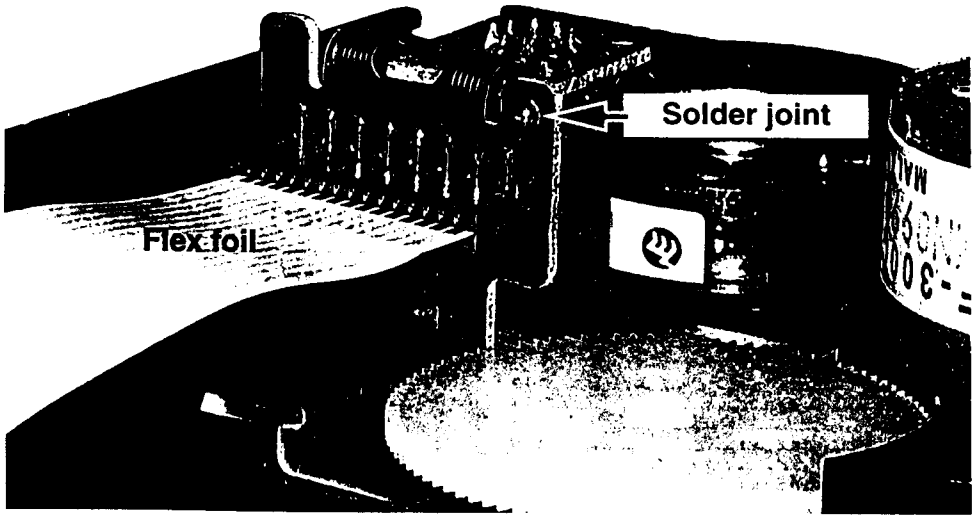


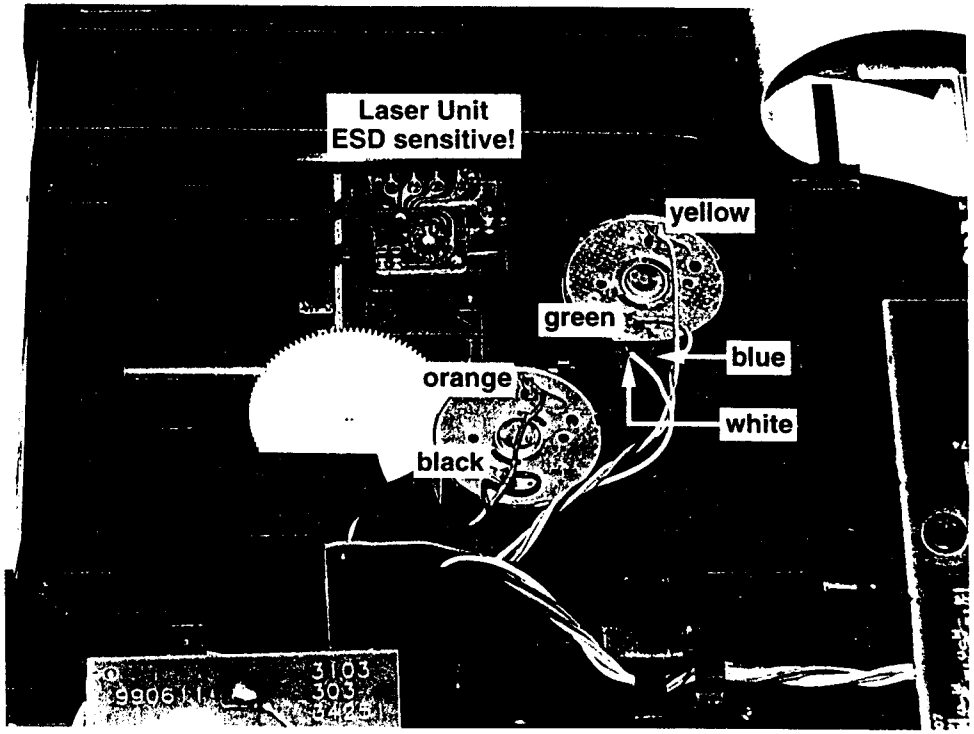
fig.1

Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



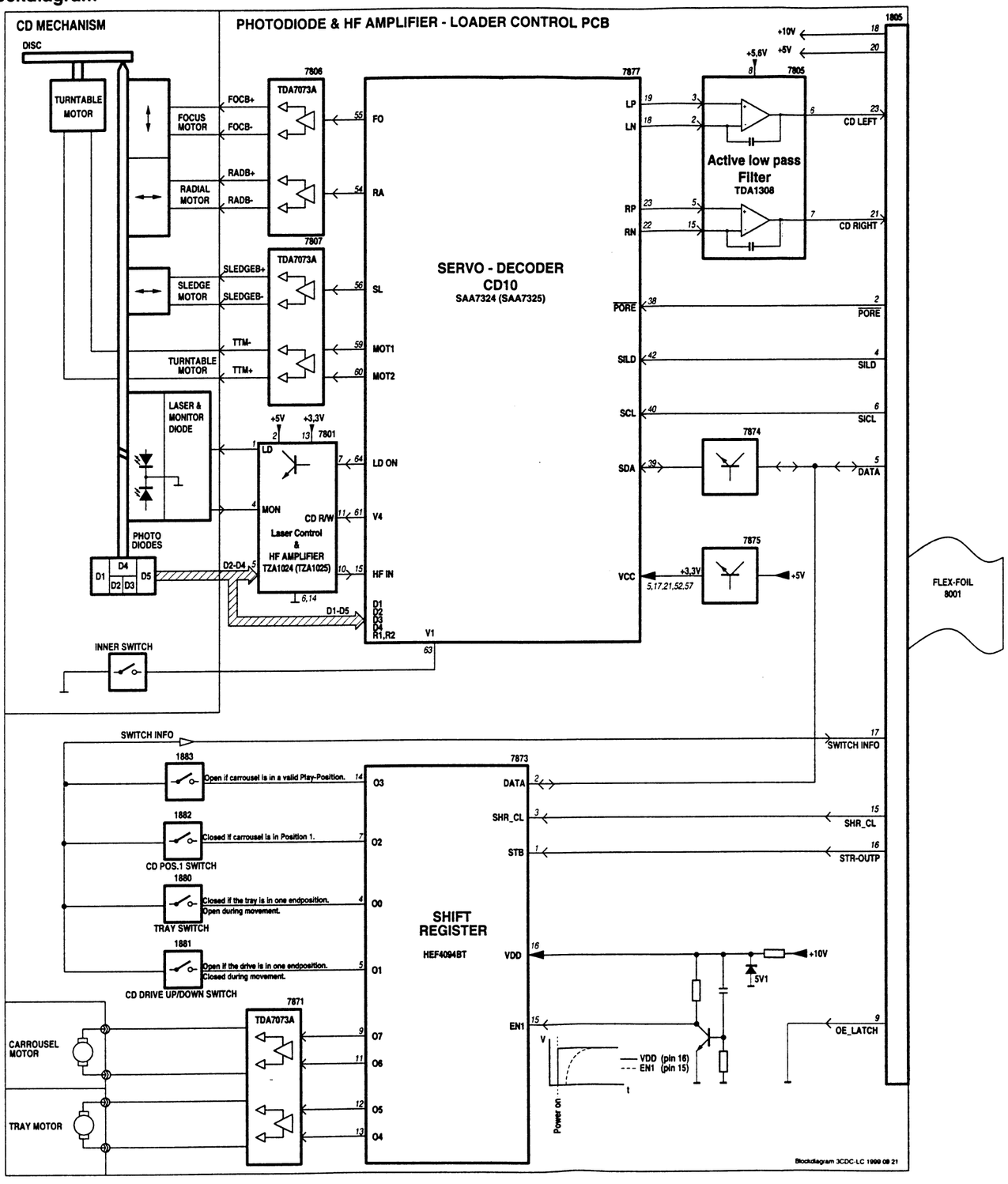
Service Position

Wiring

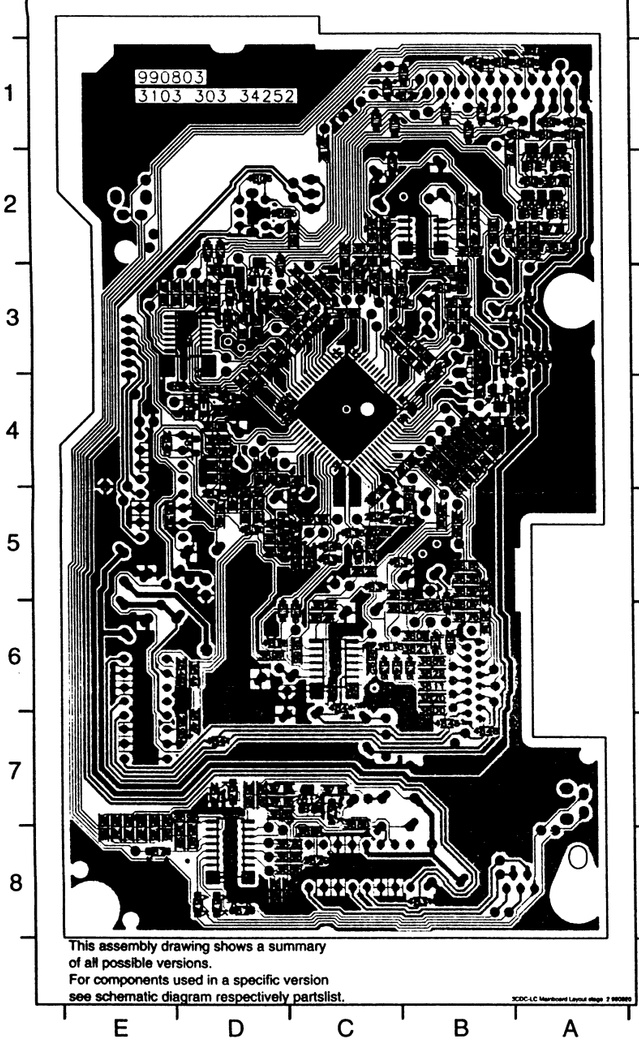

Laser Unit
ESD sensitive!
yellow
green
blue
orange
white
black

10-5

Blockdiagram



3CDC-LC Mainboard Copperside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

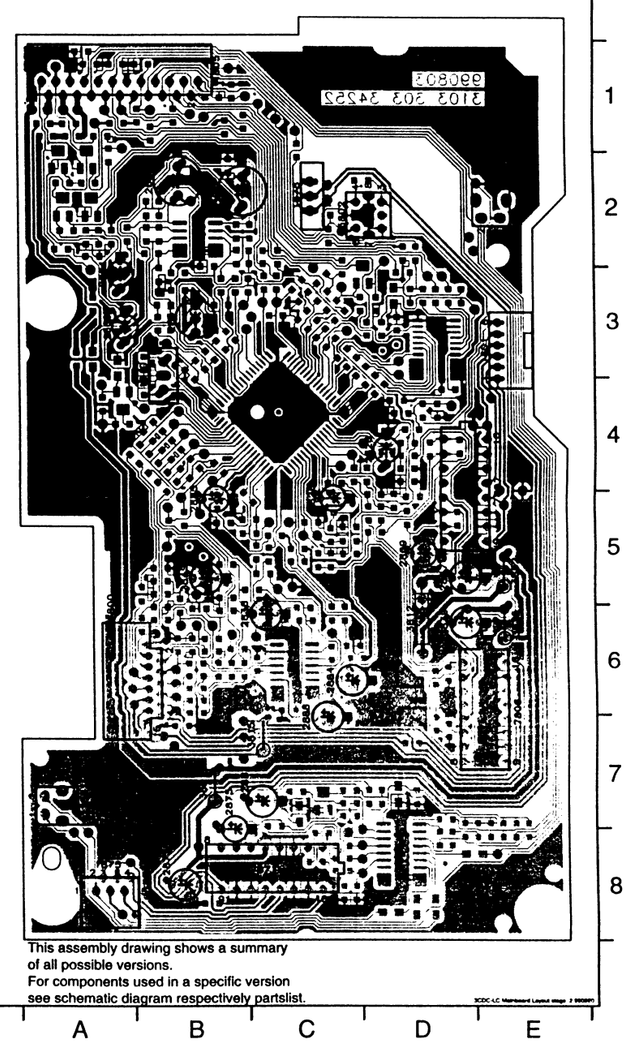
3CDC-LC Mainboard Layout stage 2 990803

CS 53 305

Mapping

Copperside					Componentside
2800	B6	3751	B2	3889 D3	1800 A6
2801	B4	3770	C3	3890 D8	1801 E3
2802	B6	3771	A2	3891 D8	1805 B1
2803	B4	3772	A2	3892 D3	1810 B3
2805	B4	3780	C3	3893 D7	1875 A8
2806	B4	3781	C2	3894 B5	1878 C2
2807	B6	3782	A2	3895 C5	1880 E2
2808	B4	3800	B6	3897 D6	1881 A7
2810	B5	3801	B5	3898 D7	2809 D5
2811	B4	3802	B6	3899 A4	2826 C5
2815	C6	3803	B4	4800 A1	2828 D4
2816	C3	3804	C3	4801 B1	2837 D5
2818	B3	3805	B4	4802 B1	2838 C6
2822	C5	3806	B4	4803 D2	2839 D6
2823	C5	3807	B4	4804 A1	2849 B5
2824	C5	3808	B4	4805 A1	2851 B3
2825	B5	3809	D4	4806 A1	2858 B2
2829	C8	3811	B6	4807 A1	2860 A3
2830	B3	3814	B4	4808 A1	2861 A3
2831	C2	3819	C3	4809 A2	2873 B8
2832	B3	3820	B6	4810 B2	2875 B7
2833	B3	3821	B6	4811 D6	2876 B2
2834	B4	3822	B6	4812 D6	2881 C7
2835	D5	3823	C6	4813 B1	2884 C6
2840	E4	3824	C6	4814 B1	2885 B5
2841	D5	3825	C5	4815 B1	2888 C7
2842	D6	3826	C5	4816 B1	3812 D6
2844	D5	3827	B4	4817 C1	3815 C7
2850	C3	3828	D4	4818 C1	3835 E6
2852	D3	3831	D3	4819 C1	3851 B7
2853	D4	3832	C3	4820 B3	3852 E5
2854	D4	3833	B5	4821 D2	5802 D2
2855	B5	3834	B6	4822 A3	7806 E6
2856	C3	3837	D4	4823 A3	7807 E5
2857	D5	3838	D4	4824 A3	7871 C8
2859	C5	3839	D5	4825 C2	
2862	B3	3840	C5	4826 C3	
2863	B3	3841	D4	4827 B1	
2864	D4	3842	D4	4828 D3	
2865	C2	3843	D5	4829 D2	
2867	B2	3844	D6	4830 D5	
2869	B6	3845	D4	4831 B8	
2872	D7	3846	D5	4832 D4	
2877	E8	3847	D7	4833 C5	
2878	E8	3848	C4	4834 B5	
2879	D5	3849	D5	4835 C6	
2882	C2	3850	E5	4836 B6	
2887	B3	3853	B5	4837 C5	
2891	D7	3854	A2	4838 C5	
2892	C6	3855	A2	4839 C5	
2893	E8	3856	B5	4840 C6	
3700	D4	3857	B5	4841 D7	
3705	E3	3858	A2	4842 C5	
3706	D3	3859	A2	4843 C6	
3707	D3	3860	B2	4844 C6	
3708	D3	3861	B3	4845 B7	
3709	C3	3862	B3	4846 B6	
3711	D3	3863	D4	4847 B6	
3712	C1	3864	B2	4848 B7	
3713	C7	3866	C6	4849 B1	
3714	D7	3867	B3	4876 A3	
3715	D7	3868	C2	6871 E8	
3716	D4	3869	B6	6872 D8	
3717	D4	3870	B6	6873 D8	
3718	D3	3871	E8	6874 C7	
3727	C3	3872	C2	6875 D7	
3728	C3	3873	C3	6876 A3	
3730	C3	3874	C2	6877 B3	
3731	D3	3875	D3	6878 D8	
3732	D3	3876	D3	6879 D3	
3733	D3	3877	E8	7801 C6	
3734	D4	3878	A1	7805 B2	
3735	C5	3879	C8	7812 C7	
3736	C5	3880	C7	7850 A2	
3740	B3	3881	D7	7851 A2	
3741	B3	3882	D8	7860 A2	
3742	B3	3883	C8	7861 A2	
3743	C3	3884	C8	7873 D8	
3744	B2	3885	C8	7874 D3	
3746	C2	3886	D8	7875 B4	
3750	B2	3887	D7	7876 D3	
		3888	E8	7877 C4	

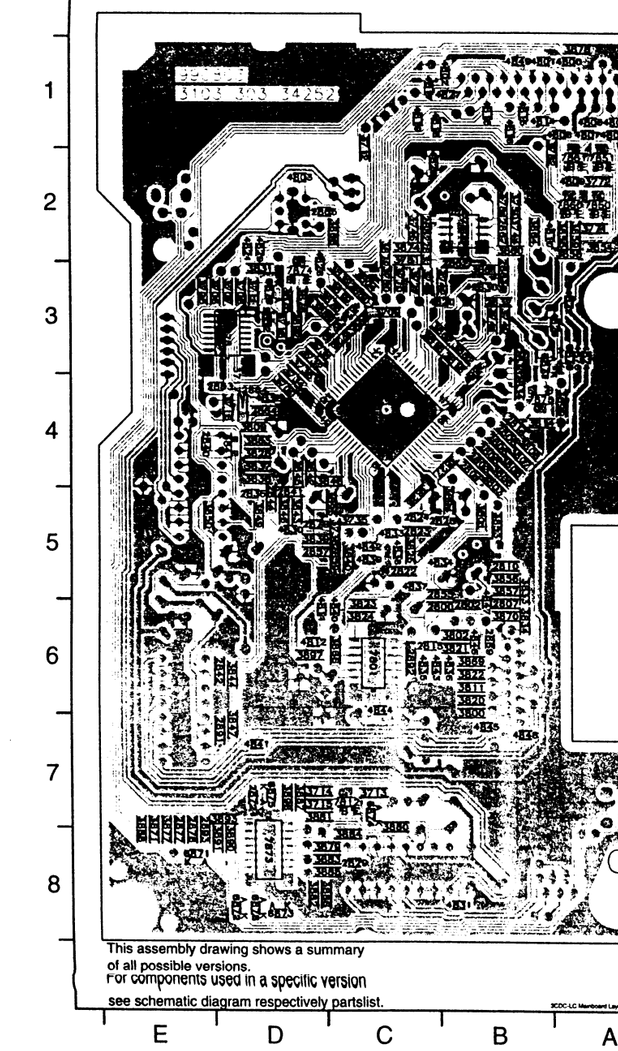
3CDC-LC Mainboard Componentside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

3CDC-LC Mainboard Layout stage 2 990803

3CDC-LC Mainboard Copperside view



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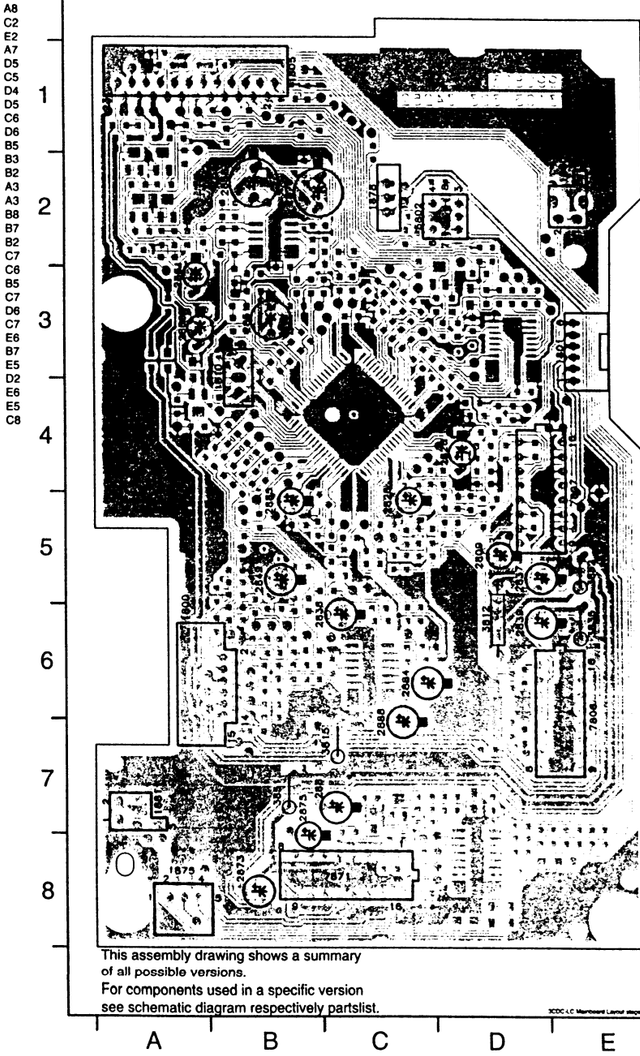
3CDC-LC Mainboard Layout stage 2 990805

CS 53 307

Mapping

Copperside					Componentside
2800	B6	3751	B2	3889 D3	1800 A6
2801	B4	3770	C3	3890 D8	1801 E3
2802	B6	3771	A2	3891 D8	1805 B1
2803	B4	3772	A2	3892 D3	1810 B3
2805	B4	3780	C3	3893 D7	1875 A8
2806	B4	3781	C2	3894 B5	1878 C2
2807	B6	3782	A2	3895 C5	1880 E2
2808	B4	3800	B6	3897 D6	1881 A7
2810	B5	3801	B5	3898 D7	2809 D5
2811	B4	3802	B6	3899 A4	2826 C5
2815	C6	3803	B4	4800 A1	2828 D4
2816	C3	3804	C3	4801 B1	2837 D5
2818	B3	3805	B4	4802 B1	2838 C6
2822	C5	3806	B4	4803 D2	2839 D6
2823	C5	3807	B4	4804 A1	2849 B5
2824	C5	3808	B4	4805 A1	2851 B3
2825	B5	3809	D4	4806 A1	2858 B2
2829	C8	3811	B6	4807 A1	2860 A3
2830	B3	3814	B4	4808 A1	2861 A3
2831	C2	3819	C3	4809 A2	2873 B8
2832	B3	3820	B6	4810 B2	2875 B7
2833	B3	3821	B6	4811 D6	2876 B2
2834	B4	3822	B6	4812 D6	2881 C7
2835	D5	3823	C6	4813 B1	2884 C6
2840	E4	3824	C6	4814 B1	2885 B5
2841	D5	3825	C5	4815 B1	2888 C7
2842	D6	3826	C5	4816 B1	3812 D6
2844	D5	3827	B4	4817 C1	3815 C7
2850	C3	3828	D4	4818 C1	3835 E6
2852	D3	3831	D3	4819 C1	3851 B7
2853	D4	3832	C3	4820 B3	3852 E5
2854	D4	3833	B5	4821 D2	5802 D2
2855	B5	3834	B6	4822 A3	7806 E6
2856	C3	3837	D4	4823 A3	7807 E5
2857	D5	3838	D4	4824 A3	7871 C8
2859	C5	3839	D5	4825 C2	
2862	B3	3840	C5	4826 C3	
2863	B3	3841	D4	4827 B1	
2864	D4	3842	D4	4828 D3	
2865	C2	3843	D5	4829 D2	
2867	B2	3844	D6	4830 D5	
2869	B6	3845	D4	4831 B8	
2872	D7	3846	D5	4832 D4	
2877	E8	3847	D7	4833 C5	
2878	E8	3848	C4	4834 B5	
2879	D5	3849	D5	4835 C6	
2882	C2	3850	E5	4836 B6	
2887	B3	3853	B5	4837 C5	
2891	D7	3854	A2	4838 C5	
2892	C6	3855	A2	4839 C5	
2893	E8	3856	B5	4840 C6	
3700	D4	3857	B5	4841 D7	
3705	E3	3858	A2	4842 C5	
3706	D3	3859	A2	4843 C6	
3707	D3	3860	B2	4844 C6	
3708	D3	3861	B3	4845 B7	
3709	C3	3862	B3	4846 B6	
3711	D3	3863	D4	4847 B6	
3712	C1	3864	B2	4848 B7	
3713	C7	3866	C6	4849 B1	
3714	D7	3867	B3	4876 A3	
3715	D7	3868	C2	6871 E8	
3716	D4	3869	B6	6872 D8	
3717	D4	3870	B6	6873 D8	
3718	D3	3871	E8	6874 C7	
3727	C3	3872	C2	6875 D7	
3728	C3	3873	C3	6876 A3	
3730	C3	3874	C2	6877 B3	
3731	D3	3875	D3	6878 D8	
3732	D3	3876	D3	6879 D3	
3733	D3	3877	E8	7801 C6	
3734	D4	3878	A1	7805 B2	
3735	C5	3879	C8	7812 C7	
3736	C5	3880	C7	7850 A2	
3740	B3	3881	D7	7851 A2	
3741	B3	3882	D8	7860 A2	
3742	B3	3883	C8	7861 A2	
3743	C3	3884	C8	7873 D8	
3744	B2	3885	C8	7874 D3	
3746	C2	3886	D8	7875 B4	
3750	B2	3887	D7	7876 D3	
		3888	E8	7877 C4	

3CDC-LC Mainboard Componentside view



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For components used in a specific version
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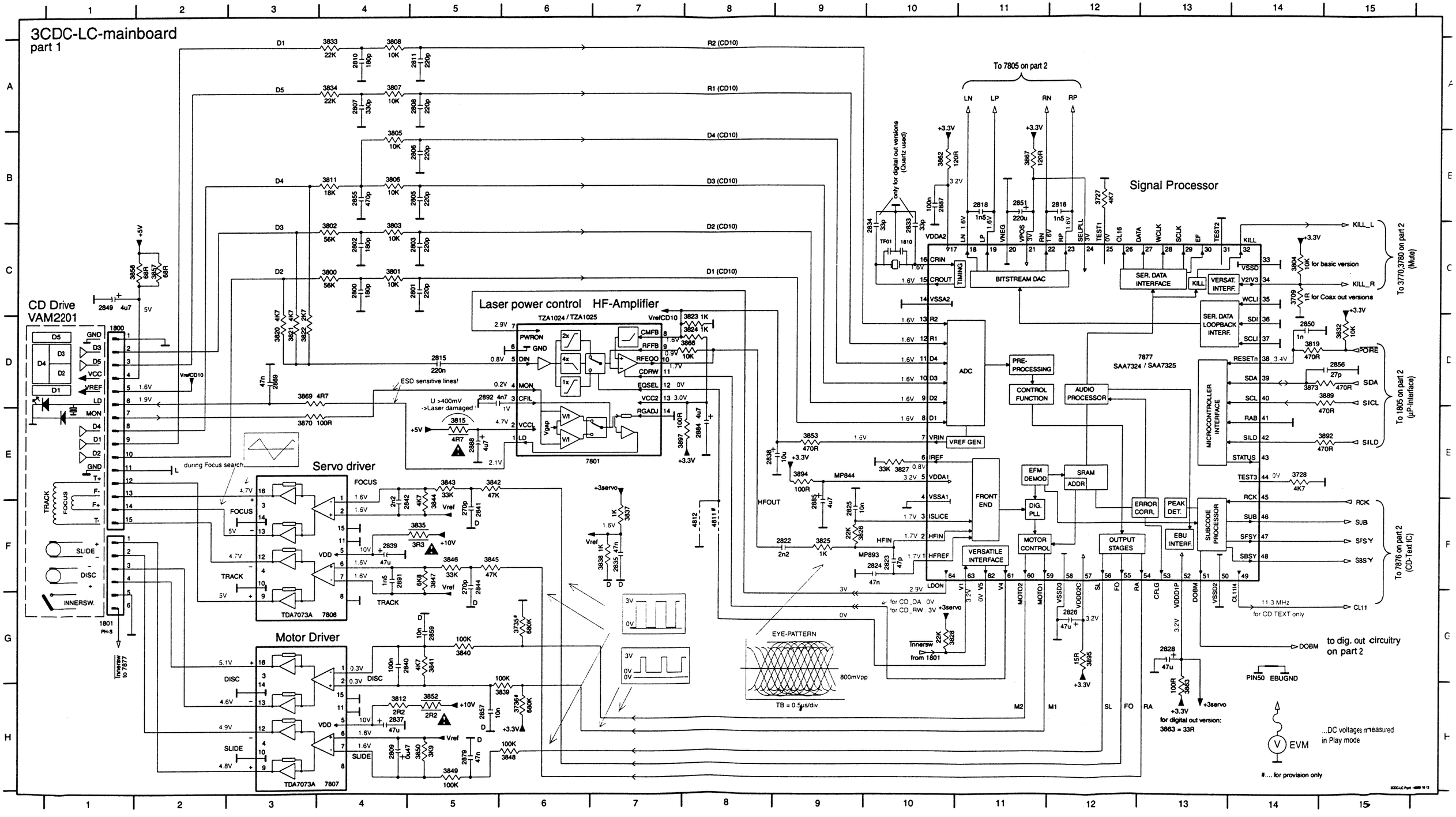
3CDC-LC Mainboard Layout stage 2 990805

1800 D1	2802 C4	2808 A5	2816 B12	2825 F9	2835 F7	2841 F5	2851 B11	2869 D3	2888 E5	3728 E14	3802 C4	3807 A4	3819 D14	3824 D8	3832 D15	3838 F7	3843 E5	3848 H6	3856 C1	3867 B11	3892 E15	4812 F8	MP713 C5	MP730 B5	MP800 E3	MP814 F2	MP819 G9	MP829 B3	MP841 F6	MP846 G1	MP851 E2	MP859 F10	MP873 H4	MP883 E5
1801 G1	2803 C5	2809 H4	2818 B11	2826 G12	2837 H4	2842 F5	2855 B4	2879 H5	2891 F4	3735 G6	3803 C4	3808 A4	3820 D3	3825 F9	3833 A4	3839 H6	3844 F5	3849 H5	3857 C2	3869 D3	3894 E9	7801 E7	MP715 C5	MP731 B13	MP802 B15	MP815 C3	MP820 F8	MP837 E3	MP842 H6	MP847 G2	MP852 F2	MP860 C2	MP875 G13	MP884 E5
1810 C10	2805 B5	2810 A4	2822 F9	2828 G13	2838 E8	2844 F5	2856 D15	2884 E8	2892 D5	3736 H6	3804 C14	3811 B4	3821 D3	3826 F9	3834 A4	3840 G5	3845 F5	3850 H5	3862 B10	3870 E3	3895 G12	7806 G4	MP716 A5	MP743 D2	MP809 E10	MP816 A3	MP821 D15	MP838 G6	MP843 F6	MP848 E2	MP853 F2	MP861 E8	MP877 E4	MP893 F10
2800 C4	2806 B5	2811 A5	2823 F10	2833 C10	2839 F4	2849 C1	2857 H5	2885 F9	3709 C14	3800 C4	3805 B4	3812 H4	3822 D3	3827 E10	3835 F5	3841 G5	3846 F5	3852 H5	3863 H13	3873 D14	3897 E7	7807 H4	MP717 A5	MP744 D2	MP812 F2	MP817 A3	MP827 B10	MP839 G6	MP844 E9	MP849 F2	MP855 E10	MP870 D8	MP878 B13	MP895 E14
2801 C5	2807 A4	2815 D5	2824 F10	2834 C10	2840 G4	2850 D14	2859 G5	2887 B10	3727 B12	3801 C4	3806 B4	3815 E5	3823 D8	3828 G10	3837 F7	3842 E5	3847 F5	3853 E9	3866 D8	3889 D15	4811 F8	7877 D12	MP729 B5	MP745 E2	MP813 C3	MP818 D3	MP828 G9	MP840 E6	MP845 F4	MP850 F2	MP858 F9	MP872 C15	MP879 B11	MP896 B12

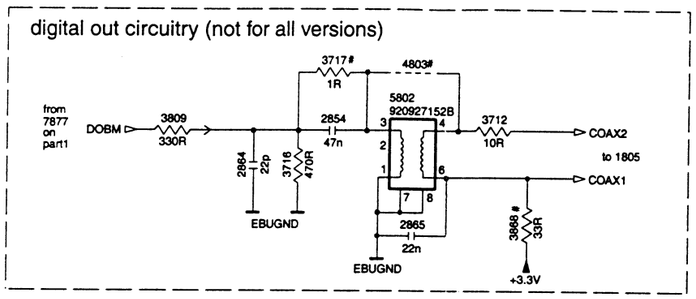


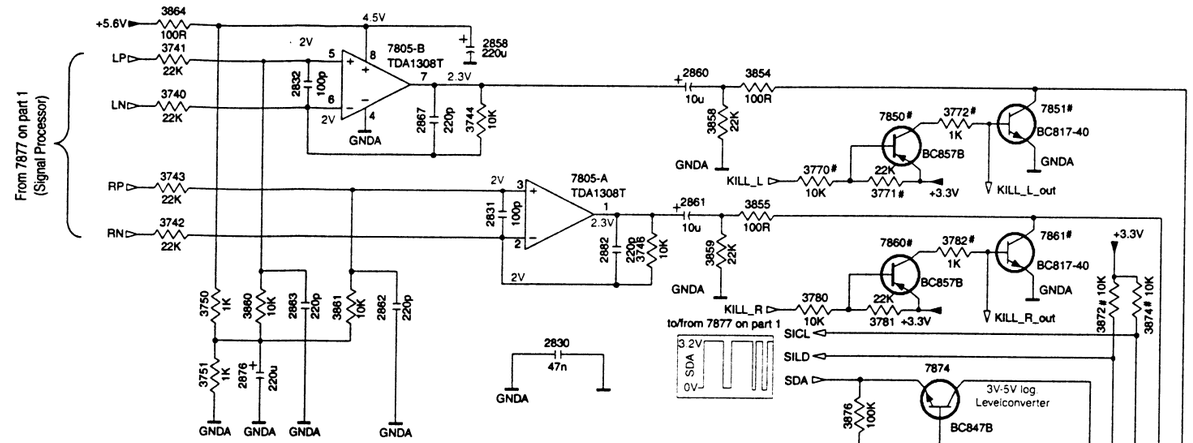
10-9

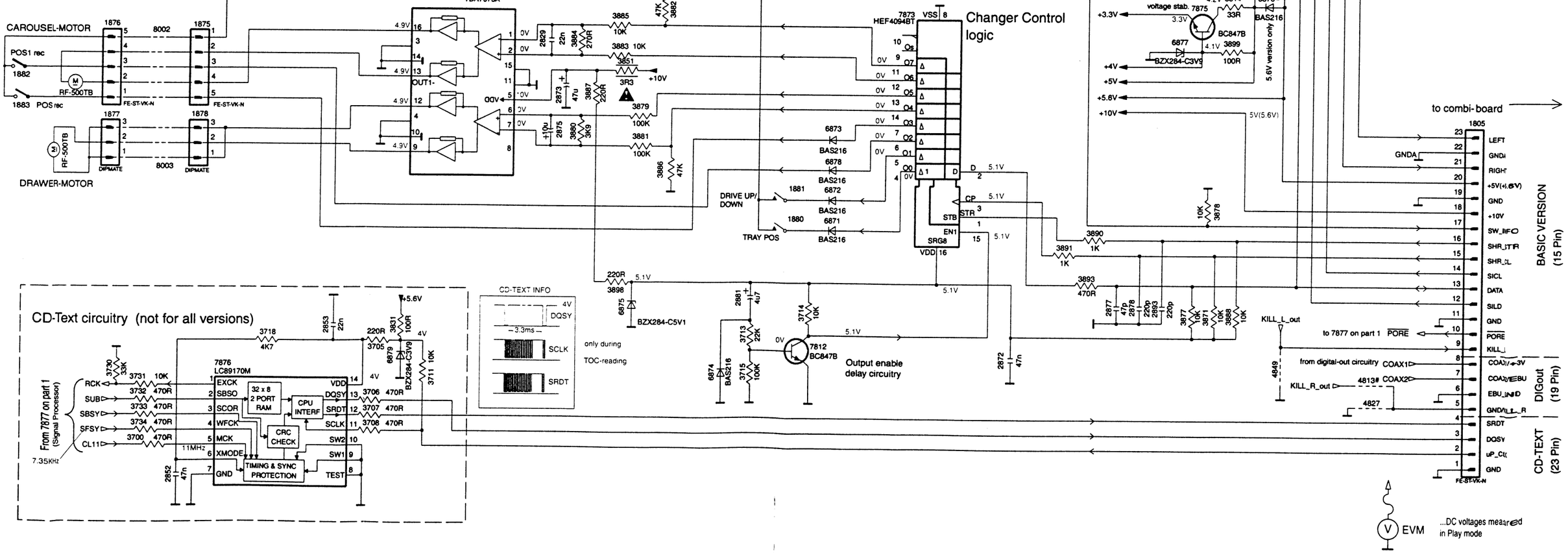
1805 D15 1875 D2 1878 D2 1880 E8 1881 E8 2829 D6
2830 B10 2831 B9 2832 A8 2852 H2 2853 F4 2854 B3
2858 A10 2860 A10 2861 B10 2862 B9 2863 B8 2864 B3
2865 C4 2867 A9 2872 G10 2873 D6 2875 E6 2876 C8
2877 F11 2878 F11 2881 F8 2882 B10 2893 F12 3700 H2
3705 G4 3706 G4 3707 G4 3706 G4 3711 G5 3712 B4
3713 F8 3714 F8 3715 G8 3716 B3 3717 B3 3718 G3
3730 G2 3731 G2 3732 G2 3733 G2 3734 G2 3740 A7
3741 A7 3742 B7 3743 A7 3744 A9 3746 B10 3750 B7
3751 C7 3770 A11 3771 A12 3772 A12 3780 B11 3781 B12
3782 B12 3809 B2 3814 C12 3831 F4 3851 D6 3854 A11
3855 B11 3858 A11 3859 B11 3860 B8 3861 B8 3864 A7
3868 C4 3871 F12 3872 B13 3874 B13 3875 C12 3876 C11
3877 F12 3878 E12 3879 D7 3880 E6 3881 E7 3882 C7
3883 D6 3884 D6 3885 C6 3886 E7 3887 D6 3888 F12
3890 F11 3891 F11 3893 F11 3898 F6 3899 D12 4803 B4
4813 G14 4827 G14 4849 G13 4876 C13 5802 B4 6871 E8
6872 E8 6873 E8 6874 G7 6875 F6 6876 C13 6877 D12
6878 E8 6879 G4 7805-A A10 7805-B A9 7812 G8 7850 A12
7851 A13 7860 B12 7861 B13 7871 C5 7873 C9 7874 C12
7875 C12 7876 G3 MP721 C8 MP722 E8 MP723 C8 MP724 D8
MP725 D8 MP726 D8 MP740 H14 MP741 G14 MP742 G14 MP801 D12
MP803 F10 MP804 G14 MP805 E13 MP806 F13 MP807 F14 MP808 E13
MP810 F13 MP811 F13 MP822 E3 MP823 D3 MP824 D4 MP825 D4
MP830 A9 MP832 G9 MP833 F13 MP834 G14 MP835 F14 MP854 A13
MP856 E14 MP857 B13 MP862 G13 MP865 D11 MP866 E8
MP867 E8 MP868 F8 MP869 C12 MP874 D12 MP881 G2
MP882 G2 MP886 G3 MP887 H5 MP888 G5 MP889 G5 MP890 B3
MP891 B5 MP892 B5 MP897 D12 MP898 D13 MP899 E14

3CDC-LC-mainboard

part 2

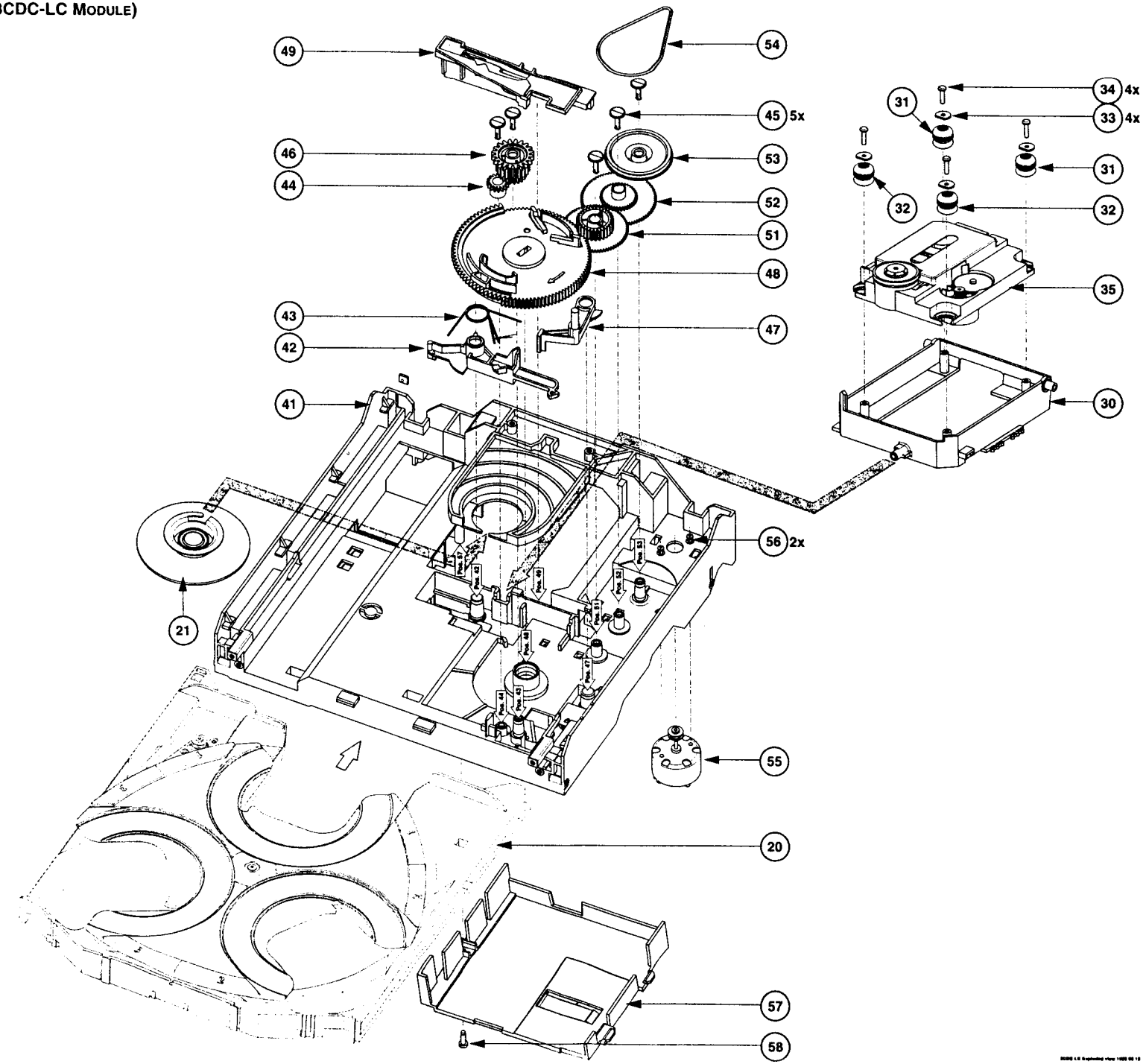




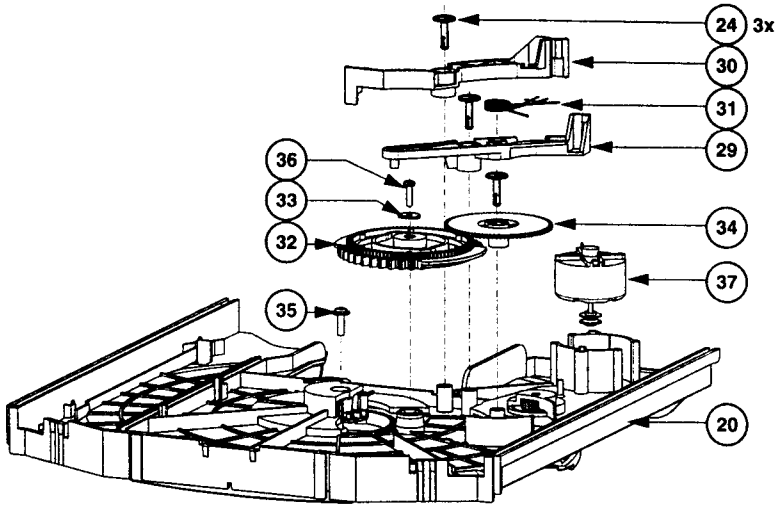


10-10

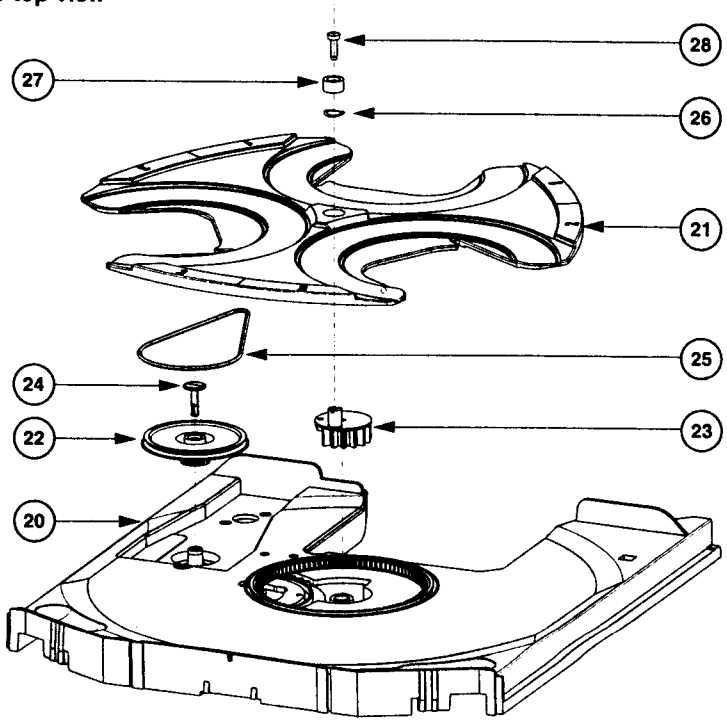
EXPLODED VIEW (3CDC-LC MODULE)



Drawer bottom view



Drawer top view



MECHANICAL PARTS LIST - 3CDC-LC DRAWER ASSEMBLY (Page 10-11)

0020	310330466500	DRAWER	0029	310330466550	BRACKET-DISC
0021	310330466490	CARROUSELL	0030	310330466520	TUMBLER
0022	310330406860	PULLEY-DRAWER	0031	310330106470	SPRING-DISC
0023	310330406850	ECCENTRIC	0032	310330406920	CONTROL-DISC
0024	310330406980	NAIL	0033	310330406970	WASHER
0025	310330466850	DRIVING-BELT-CARROUSEL	0034	310330406870	GEAR-1
0027	482253212365	BUSH DRAWER	0037	482236110753	MOTOR ASSY
0027	310330407100	BUSH DRAWER / BWC Version			

MECHANICAL PARTS LIST - 3CDC-LC MODULE (Page 10-10)

0021	314011758650	CLAMPER ASSY-VAM	0047	310330466530	BRACKET-LOAD
0030	310330466560	SUPPORT	0048	310330406910	CAM
0031	482252910431	DAMPER - RUBBER (25DEG)	0049	310330466510	GUIDING
0032	482252910431	DAMPER - RUBBER (25DEG)	0051	310330406900	GEAR-4
0033	310330406970	WASHER	0052	310330406870	GEAR-1
0035	482269110772	VAM2201/01	0053	310330406960	PULLEY-FRAME
0041	310330466480	FRAME	0054	310330466910	DRIVING-BELT-DRAWER
0042	310330466540	BRACKET-GUIDING	0055	482236110753	MOTOR ASSY
0043	310330106460	SPRING-GUIDING	0056	482250212548	SCREW M2,6X2,9
0044	310330406890	GEAR-3	0057	310330468890	COVER-VAM
0045	310330406980	NAIL	0059	482246612146	RUBBER
0046	310330406880	GEAR-2			

ELECTRICAL PARTS LIST - 3CDC-LC MODULE

MISCELLANEOUS

1800	482226510925	Flex Foil Connector 15P
1805	482226510979	Flex Foil Connector 15P
1805	482226511545	Flex Foil Connector 19P
1805	482226511182	Flex Foil Connector 23P
1810	482224210849	RES XTL 8MHz4672
1810	482224273557	RES CER 8MHz467
1875	482226710958	Flex Foil Connector 5P
1876	242202508332	Flex Foil Connector 5P
1880	482227613503	Switch
1881	482227613503	Switch
1882	482227613503	Switch
1883	482227613503	Switch
8002	310330891990	Flex Foil 5P 200mm
8005	310330891980	Flex Foil 15P 170mm

CAPACITORS

2800	482212610326	180pF 5% 63V
2801	482212233575	220pF 5% 63V
2802	482212610326	180pF 5% 63V
2803	482212233575	220pF 5% 63V
2805	482212233575	220pF 5% 63V
2806	482212233575	220pF 5% 63V
2807	532212231863	330pF 5% 63V
2808	482212233575	220pF 5% 63V
2809	532212441948	470nF 20% 50V
2810	482212610326	180pF 5% 63V
2811	482212233575	220pF 5% 63V
2815	482212614076	220nF +80/-20% 25V
2816	482212613344	1,5nF 5% 63V
2818	482212613344	1,5nF 5% 63V
2822	222286115222	2,2nF 5% 50V
2823	482212613692	47pF 1% 63V
2824	482212613751	47nF 10% 63V
2825	482212233177	10nF 20% 50V
2826	482212412362	47µF 20% 4V
2828	482212412362	47µF 20% 4V
2829	532212232654	22nF 10% 63V
2830	482212613751	47nF 10% 63V
2831	532212232531	100pF 5% 50V
2832	532212232531	100pF 5% 50V
2833	532212232659	33pF 5% 50V
2834	532212232659	33pF 5% 50V
2835	482212613751	47nF 10% 63V
2837	482212440433	47µF 20% 25V
2838	482212440248	10µF 20% 63V
2839	482212440433	47µF 20% 25V

ELECTRICAL PARTS LIST - 3CDC-LC MODULE

CAPACITORS

2840	482212614585	100nF 10% 50V
2841	482212233216	270pF 5% 50V
2842	482212233127	2,2nF 10% 63V
2844	482212233216	270pF 5% 50V
2849	482212440769	4,7µF 20% 100V
2850	532212231647	1nF 10% 63V
2851	482212442383	220µF 20% 4V
2852	482212613751	47nF 10% 63V
2853	532212232654	22nF 10% 63V
2854	482212613751	47nF 10% 63V
2855	532212234099	470pF 10% 63V
2856	482212613691	27pF 1% 63V
2857	482212233177	10nF 20% 50V
2858	482212412245	220µF 20%
2859	482212233177	10nF 20% 50V
2860	482212411947	10µF 20% 16V
2861	482212411947	10µF 20% 16V
2862	482212233575	220pF 5% 63V
2863	482212233575	220pF 5% 63V
2864	532212232658	22pF 5% 50V
2865	532212232654	22nF 10% 63V
2867	482212233575	220pF 5% 63V
2869	482212613751	47nF 10% 63V
2872	482212613751	47nF 10% 63V
2873	482212480231	47µF 20% 16V
2875	482212411947	10µF 20% 16V
2876	482212412245	220µF 20%
2877	482212613692	47pF 1% 63V
2878	482212233575	220pF 5% 63V
2879	482212613751	47nF 10% 63V
2881	482212440769	4,7µF 20% 100V
2882	482212233575	220pF 5% 63V
2884	482212440769	4,7µF 20% 100V
2885	482212440769	4,7µF 20% 100V
2887	482212614585	100nF 10% 50V
2888	482212440769	4,7µF 20% 100V
2891	532212231865	1,5nF 10% 63V
2892	532212610223	4,7nF 10% 63V
2893	482212233575	220pF 5% 63V

RESISTORS

3700	482205120471	470R 5% 0,1W
3705	482211711503	220R 1% 0,1W
3706	482205120471	470R 5% 0,1W
3707	482205120471	470R 5% 0,1W
3708	482205120471	470R 5% 0,1W
3709	482205120108	1R 5% 0,1W
3711	482211710833	10k 1% 0,1W
3712	482205120109	10R 5% 0,1W
3713	482205120223	22k 5% 0,1W
3714	482211710833	10k 1% 0,1W
3715	482211710837	100k 1% 0,1W
3716	482205120471	470R 5% 0,1W
3718	482205120472	4k7 5% 0,1W
3727	482205120472	4k7 5% 0,1W
3728	482205120472	4k7 5% 0,1W
3730	482205120333	33k 5% 0,1W
3731	482211710833	10k 1% 0,1W
3732	482205120471	470R 5% 0,1W
3733	482205120471	470R 5% 0,1W
3734	482205120471	470R 5% 0,1W
3740	482205120223	22k 5% 0,1W
3741	482205120223	22k 5% 0,1W
3742	482205120223	22k 5% 0,1W
3743	482205120223	22k 5% 0,1W
3744	482211710833	10k 1% 0,1W
3746	482211710833	10k 1% 0,1W
3750	482205110102	1k 2% 0,25W
3751	482205110102	1k 2% 0,25W
3800	482211711148	56k 1% 0,1W
3801	482211710833	10k 1% 0,1W
3802	482211711148	56k 1% 0,1W
3803	482211710833	10k 1% 0,1W
3804	482211710833	10k 1% 0,1W
3805	482211710833	10k 1% 0,1W
3806	482211710833	10k 1% 0,1W
3807	482211710833	10k 1% 0,1W
3808	482211710833	10k 1% 0,1W
3809	482211713577	330R 1% 1,25W
3811	482211710965	18k 1% 0,1W
3812	482205310228	2R2 5% 1W
3814	482205120339	33R 5% 0,1W
3815	482205210478	⚠ 4R7 5% 0,33W
3819	482205120471	470R 5% 0,1W
3820	482205120472	4k7 5% 0,1W
3821	482205120472	4k7 5% 0,1W
3822	482211712955	2k7 1% 0,1W
3823	482205110102	1k 2% 0,25W
3824	482205110102	1k 2% 0,25W
3825	482205110102	1k 2% 0,25W
3826	482205120223	22k 5% 0,1W
3827	482205120333	33k 5% 0,1W
3828	482205120223	22k 5% 0,1W
3831	482205120101	100R 5% 0,1W
3832	482211710833	10k 1% 0,1W
3833	482205120223	22k 5% 0,1W
3834	482205120223	22k 5% 0,1W
3835	482205210338	⚠ 3R3 5% 0,33W
3837	482205110102	1k 2% 0,25W
3838	482205110102	1k 2% 0,25W
3839	482211710837	100k 1% 0,1W
3840	482211710837	100k 1% 0,1W
3841	482205120472	4k7 5% 0,1W
3842	482211710834	47k 1% 0,1W
3843	482205120333	33k 5% 0,1W
3844	482205120472	4k7 5% 0,1W

RESISTORS

3845	482211710834	47k 1% 0,1W
3846	482205120333	33k 5% 0,1W
3847	482211711507	6k8 1% 0,1W
3848	482211710837	100k 1% 0,1W
3849	482211710837	100k 1% 0,1W
3850	482205120392	3k9 5% 0,1W
3851	482205210338	⚠ 3R3 5% 0,33W
3852	482205210228	⚠ 2R2 5% 0,33W
3853	482205120471	470R 5% 0,1W
3854	482205120101	100R 5% 0,1W
3855	482205120101	100R 5% 0,1W
3856	482211712521	68R 1% 0,1W
3857	482211712521	68R 1% 0,1W
3858	482205120223	22k 5% 0,1W
3859	482205120223	22k 5% 0,1W
3860	482211710833	10k 1% 0,1W
3861	482211710833	10k 1% 0,1W
3862	482205120121	120R 5% 0,1W
3863	482205120101	100R 5% 0,1W
3863	482205120339	33R 5% 0,1W
3864	482205120101	100R 5% 0,1W
3866	482211710833	10k 1% 0,1W
3867	482205120121	120R 5% 0,1W
3869	482205120478	4R7 5% 0,1W
3870	482205120101	100R 5% 0,1W
3871	482211710833	10k 1% 0,1W
3873	482205120471	470R 5% 0,1W
3875	482211710833	10k 1% 0,1W
3876	482211710837	100k 1% 0,1W
3877	482211710833	10k 1% 0,1W
3878	482211710833	10k 1% 0,1W
3879	482211710837	100k 1% 0,1W
3880	482205120392	3k9 5% 0,1W
3881	482211710837	100k 1% 0,1W
3882	482211710834	47k 1% 0,1W
3883	482211710833	10k 1% 0,1W
3884	482211711504	270R 1% 0,1W
3885	482211710833	10k 1% 0,1W
3886	482211710834	47k 1% 0,1W
3887	482211711503	220R 1% 0,1W
3888	482211710833	10k 1% 0,1W
3889	482205120471	470R 5% 0,1W
3890	482205110102	1k 2% 0,25W
3891	482205110102	1k 2% 0,25W
3892	482205120471	470R 5% 0,1W
3893	482205120471	470R 5% 0,1W
3894	482205120101	100R 5% 0,1W
3895	482205120159	15R 5% 0,1W
3897	482205120101	100R 5% 0,1W
3898	482211711503	220R 1% 0,1W
3899	482205120101	100R 5% 0,1W
4800	482205120008	0R Jumper 0805
4801	482205120008	0R Jumper 0805
4802	482205120008	0R Jumper 0805
4804	482205120008	0R Jumper 0805
4805	482205120008	0R Jumper 0805
4806	482205120008	0R Jumper 0805
4807	482205120008	0R Jumper 0805
4808	482205120008	0R Jumper 0805
4810	482205120008	0R Jumper 0805
4812	482205120008	0R Jumper 0805
4817	482205120008	0R Jumper 0805
4818	482205120008	0R Jumper 0805
4819	482205120008	0R Jumper 0805
4820	482205120008	0R Jumper 0805
4821	482205120008	0R Jumper 0805
4822	482205120008	0R Jumper 0805
4823	482205120008	0R Jumper 0805
4824	482205120008	0R Jumper 0805
4825	482205120008	0R Jumper 0805
4826	482205120008	0R Jumper 0805
4827	482205120008	0R Jumper 0805
4828	482205120008	0R Jumper 0805
4830	482205120008	0R Jumper 0805
4831	482205120008	0R Jumper 0805
4832	482205120008	0R Jumper 0805
4833	482205120008	0R Jumper 0805
4834	482205120008	0R Jumper 0805
4835	482205120008	0R Jumper 0805
4836	482205120008	0R Jumper 0805
4837	482205120008	0R Jumper 0805
4838	482205120008	0R Jumper 0805
4839	482205120008	0R Jumper 0805
4840	482205120008	0R Jumper 0805
4841	482205120008	0R Jumper 0805
4842	482205120008	0R Jumper 0805
4843	482205120008	0R Jumper 0805
4844	482205120008	0R Jumper 0805
4845	482205120008	0R Jumper 0805
4846	482205120008	0R Jumper 0805
4847	482205120008	0R Jumper 0805
4848	482205120008	0R Jumper 0805
4849	482205120008	0R Jumper 0805
4876	482205120008	0R Jumper 0805

COILS & FILTERS

5802	482215631058	100µH

DIODES

6871	482213083757	BAS216
6872	482213083757	BAS216
6873	482213083757	BAS216
6874	482213083757	BAS216
6875	482213011383	BZX284-C5V1
6877	482213011366	BZX284-C3V9
6878	482213083757	BAS216

DIODES

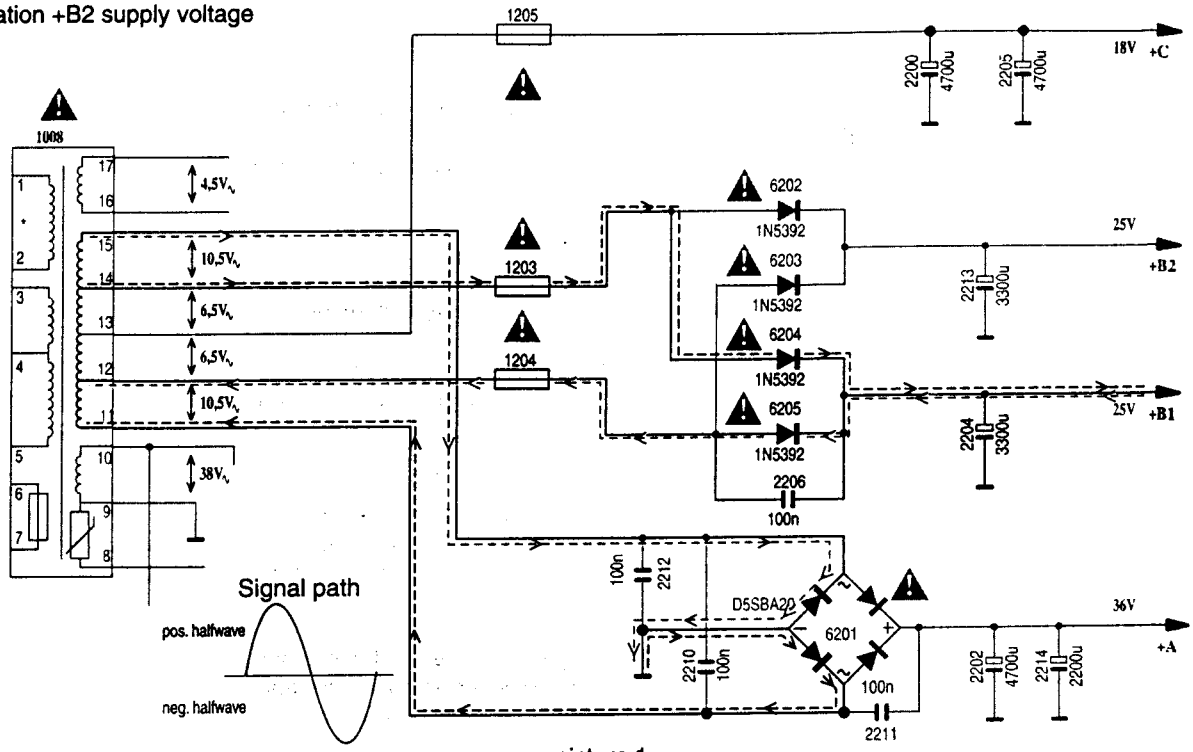
6879	482213011366	BZX284-C3V9

TRANSISTORS & INTEGRATED CIRCUITS

7801	935262236118	IC SM TZA1025T/V2
7805	482220933165	TDA1308T/N1
7806	482220932852	TDA7073A/N2
7807	482220932852	TDA7073A/N2
7812	482213060511	BC847B
7871	482220932852	TDA7073A/N2
7873	532220911306	HEF4094BT
7874	482213060511	BC847B
7875	482213060511	BC847B
7876	482220916143	LC89170M
7877	482220917324	SAA7325H

Note: Only the parts mentioned in this list are normal service spare parts.

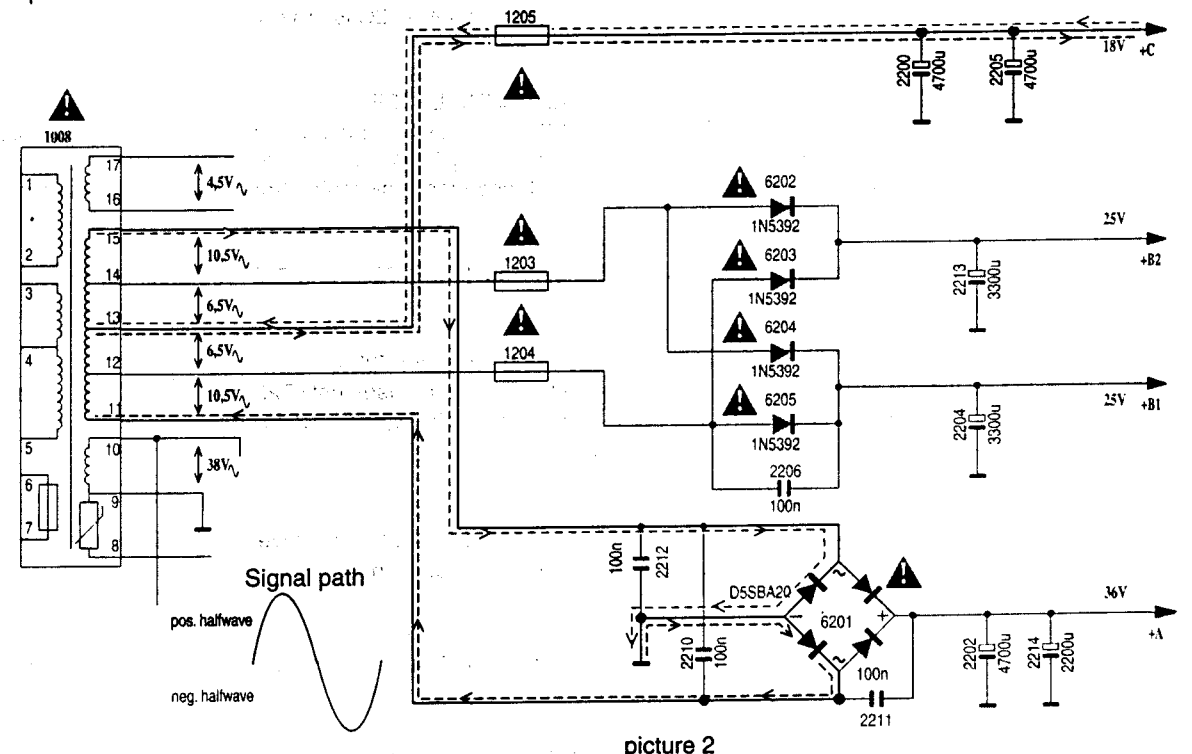
Generation +B2 supply voltage



picture 1

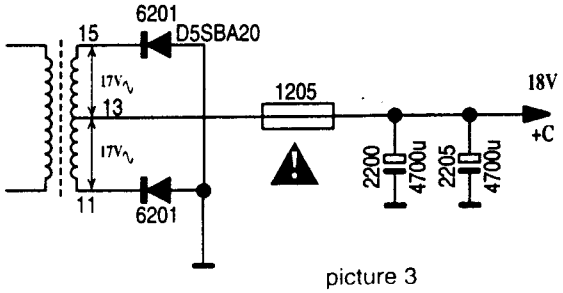
Generation of +C

Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11). See pictures 2 and 3 below.

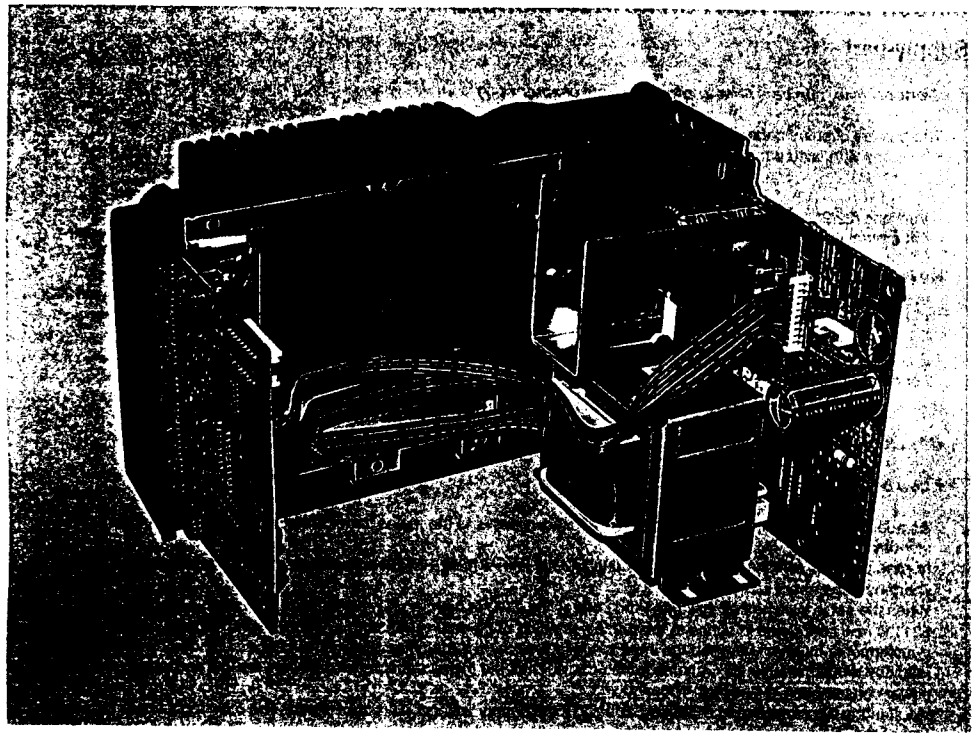


picture 2

Simplified



picture 3



POWER 4-99 Module

(2 Channel Version)

stage .6

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CIRCUIT DESCRIPTION FOR POWER4-MODULE

Supply-part

General *(pos. numbers refer to circuit diagram chapter 11-7)*

The primary circuitry depends on the version:

- Versions with fixed primary voltage: 100VAC for /26
  120VAC for /37
  220-240VAC for /22/25/30/33/34
  Versions /22/25/26/37 use radial type-fuse 1201, versions /30/33/34 use glass tube fuse 1202.
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- Version with switchable primary voltage: 110-127/220-240VAC for /21
  In version /21 voltage selector 1210 is built-in and each primary winding is protected separately (fuses 1201 and 1200).
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- European versions – *"low power standby feature"*
  For detailed description see below.

Circuit details:

- **Low power standby feature**

An additional small standby transformer, connected in series to the mains transformer, reduces power consumption in standby-mode.
In case power is switched on, the control line ECO is low → relay 1208 is activated → standby transformer 5211 is shortened and out of work.
When the set is switched off (standby) the control line ECO is high → relay 1208 is not activated → standby transformer 5211 is now connected in series to the primary winding of the mains transformer 1008. As the impedance of the standby transformer is much higher than the impedance of the mains transformer, the mainsvoltage is divided by approx. 85% (standby transformer) to 15% (mains transformer). Thus the mains transformer delivers very low secondary voltage → power consumption is less than 100mW.
Via standby transformer and rectifiers 6209-6212 the supply voltage +C is substituted. The 5,6V regulator is still working and so the microprocessor is kept running.

- **DC voltages +A, +B1/+B2, +C**

These voltages supply the Super Class G amplifier, described later in this chapter.
The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several "tricky" details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

Generation of +A

Common full wave rectifying with bridge rectifier 6201, using 100% secondary winding of mains transformer (pin 11-15).

Generation of +B1/+B2

The power supply is designed to cover both, 2-channel and 4-channel application.
While for 2-channel application only one supply voltage +B1 is sufficient, 4-channel application requires an additional supply part +B2 which supplies the Center/Surround-amplifiers and the +12V-regulator (current required by 4 amplifiers would overload a single rectifier).

The supply for 2-channel versions consists of one full wave rectifier:
– 2 diodes of bridge rectifier 6201, with 6204/6205 for generation of +B1
– +B2 is connected in parallel with a bridge wire.

The supply for 4-channel versions consists of two separate full wave rectifiers:
– 2 diodes of bridge rectifier 6201, with 6204/6205 (for +B1) and
– 2 diodes of bridge rectifier 6201, with 6202/6203 (for +B2),
using approx. 70% secondary winding of mains transformer (pin 11-14 respectively pin 12-15).
As example for generation of +B2 see picture 1.

Circuit details (continoued):

- **Supply voltages for FTD** (Fluorescent Tube Display)
  The FTD requires two supply voltages, delivered by separate windings of the mains transformer:
  – 4,5VAC for FTD heating (transformer pin 16/17)
  – -30V stabilized by the -30V regulator located on the amplifier part. The supply part delivers -35V unstabilized (transformer pin 9/10), typical value: -35V...-45V.

- **Stabilized +5V6**
  Stabilizer 7201 generates the supply voltage +5V6 for the microprocessor. In fault condition the output voltage can rise up to approx. 17V, which would definitely damage the device. Therefore an overvoltage protection for the +5V6 supply is implemented.
  Whenever the output of stabilizer rises above 7,5V, the base of 7202 reaches 0,7V (7,5V - voltage drop on 6207), the transistor switches through and short circuits the input voltage. This causes the safety resistor 3204 to blow out and interrupt immediately.

- **Temperature monitoring**
  The mains transformer is equipped with a NTC, embedded in the secondary winding (pin 8/9). Via the NTC line the temperature of the mains transformer is continuously monitored by the microprocessor. Further actions depend on the software of the set. Usually the set will be switched to standby mode when the transformer is overheated.

- **Power down (PWDN) monitoring**
  In order to enable proper switch off conditions the mains supply is monitored by the microprocessor via the PWDN line. In case of mains supply interrupts the PWDN line becomes low, while the +5V6 is still stable. This enables the microprocessor to take actions for a save shut-down (e.g. mute, reset of electronics, release of head support of tape deck).

Amplifier part

+12V-regulator *(pos. numbers refer to circuit diagram chapter 11-9)*

Is used to supply all motors (+12M) and all analogue circuits (+12A) in the set. +12C is provisional only.

- **Power on/off:**
  Switching on/off is done via the STBY-line from the microprocessor. H=ON, L=OFF
  If the STBY line is high - transistor 7222 is conductive. Base of 7224 becomes less positive than the emitter. This causes transistor 7224 to switch trough and supply the base of 7221. Consequently 7221 swiches trough too.
  Via 3218 transistor 3228 is conductive as soon as B2 is available. Consequently switching transistor 7227 is also switched through.

  If the STBY line is switched to low level base current for 7222 is blocked. In turn 7224 and 7221 are blocked. → OFF.

- **Regulation:**
  Key components are power-transistor 7221, reference diode 6221 and transistor 7223.
  After power is switched on via the STBY line as described above the +12A increases until 7223 becomes conductive via reference diode 6221 → 7223 reduces base current of 7221 → +12A is stable (typical +12,4V).
  In normal operating mode 7227 is always switched trough as described above.

- **Protections:**
  In case of overcurrent (typical 2,5A) 7227 gets out of saturation → 7226 becomes conductive → 7225 becomes conductive via 6225 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.
  Restarting is only possible with power OFF→ ON.

  In case of overvoltage (more than +15V on emitter of 7221) 7225 is now activated via 6233 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

  These protections are implemented for saving the set-electronic in any fault-condition.

-30V-regulator

- Grid supply for the FTD switched by the microprocessor.
  Simple regulation with 6251 as reference. Typical value: -29V. Maximum current: 30mA

Circuit details (continoued):

VCD- Supply:

Is a provision for versions with a Video CD Player.

This circuitry consists of a switched supply with a regulator to 5,1V (±0,15V).

- **Switching on/off** is done via the VCD_ON line from the microprocessor (H=on, L=off). If the VCD_ON line is high - transistor 7236 becomes conductive. This causes transistor 7238 to switch through. +5VCD is available. If the VCD_ON is low - transistor 7236 is blocked → no base current through 7238 → transistor 7238 is blocked too → +5VCD is switched off.

- **Regulation** is done via Z- diode 6244 and transistor 7237.
  If the +5VCD exceeds 5,1V the basis of transistor 7237 becomes higher than 0,6V via Z- diode 6244. Consequently transistor 7237 becomes conductive. This causes a reduced base current through 7236. Transistor 7236 becomes less conductive and reduces the base current trough 7238. Transistor 7238 becomes less conductive too and reduces the +5VCD.

Amplifier:

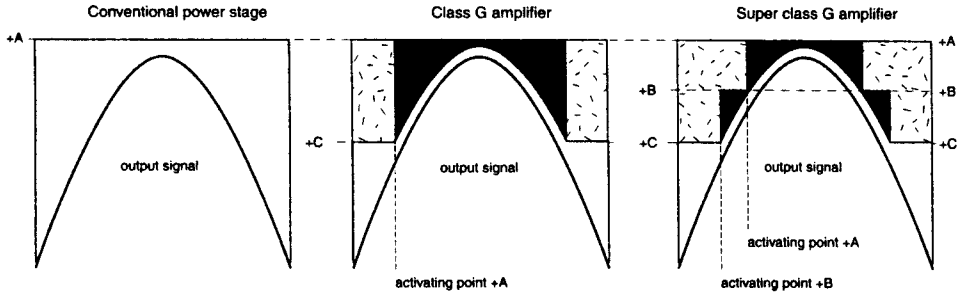
Attention: In the POWER 4 module the power amplifier IC AN7164 is used as a bridge-amplifier.
Any connection from output to ground will destroy the outpout stages!

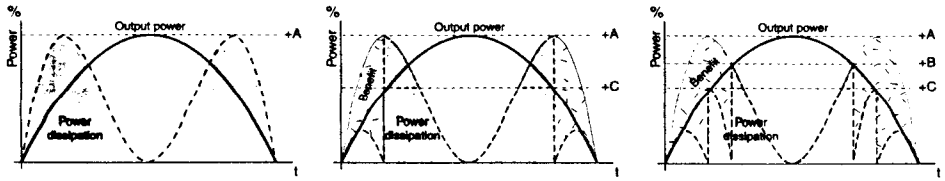
- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the µP.
  High level (approx. 4,5V): power amplifiers switched on
  Low level (approx. 0V): power amplifiers switched off

- Super class G - operation

The power amplifiers operate as so-called super class G - amplifiers:
The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.
Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:
⇒ +C (+18V) for low output power
⇒ +B (+25V) for medium output power
⇒ +A (+36V for high output power

Principle / benefit of Super Class G





- advantages: - best efficiency
  - less power drawn from the mains transformer than by conventional operating amplifiers reduces transformer heating.
  - reduced power dissipation at the amplifier ICs results in
    - less junction temperature and better reliability
    - possibility of higher output power with smaller cooling fin
    - smaller size

- Functional description of the super class G - circiuitry used in Power4-module

The DC-level on the amplifier output pins is normally Vcc/2.
With low signals +C is supplying the amplifiers via decoupling diode 6312. The DC-level on the output pins is therefore approx. 8,6V and approx. 8V on the base of 7315.
When the output signal increases, also DC-level on base of 7315 increases via diodes 6305, 6306, 6307 and 6308. At a certain output power 7315 becomes slightly conductive and enables low base current for 7304 which becomes conductive too and pulls gate of FET 7303 up to a more positive level. Thus FET 7303 begins to switch through and connects the higher DC supply +B1 slowly to the power stages.
This does not end up in a hard switching but in a smooth regulating because Vcc is coupled back to the emitter of 7315 via Zener diode 6310. As soon as Vcc increases also the level on emitter 7315 is increased by a 3,9V lower level than Vcc.
When the output power is increased further +B1 would not be high enough to enable undistorted output signal. The more the output level increases the more increases the DC-level on base of 7315 which causes the transistor more and more conducting until the summary of the voltage drop on 3340+E/B 7304+3342 becomes approx. 1,4V. Now the necessary VBE for a darlington-type transistor is obtained, 7305 begins to switch through and connects the again higher DC supply +A slowly to the power stages. 7305 regulates +A, same as described before for +B.
7322 and 7316 switch the ripple capacitor 2355, dependent on the output power.
With low output power the DC-level on base 7322 is approx. 8V. Via Zener diode 6310 and resistor 3333 the emitter is pulled to Vcc (+C at low levels). 7322 is switched through and in turn 7316. The ripple capacitor 2325 is connected to ground and functions as in normal amplifiers. Hum is suppressed and good S/N-ratio is guaranteed even during silent music passages.
When the supply voltage has to be switched to a higher level the DC-level of the ripple capacitor has to increase in the same relation, otherwise the reference voltages inside the IC would not fit to the actual Vcc. Because of the different delays this relation cannot be obtained and a continuously connected capacitor to the ripple input would cause distortion. For that reason the ripple capacitor 2325 is disconnected as soon as the output power exceeds a certain value. When the output signal increases, also DC-level on base of 7322 increases via diodes 6305, 6306, 6307 and 6308. 7322 blocks and in turn 7316. The ripple capacitor 2325 is disconnected from ground. The circuitry is designed so that 2325 is disconnected just before 7303 begins to switch +B through (see above).

- For Center/Surround-amplifier the function of the Super Class G circuit is similar. Instead of +B1 there +B2 is connected.

- For the /37-versions with two channel-application the so called MATRIX SURROUND is added. The 2 surround-speakers are added in a way, that in case of STEREO a high signal can be measured (up to 10W per speaker at 6 Ohm). In MONO only a few 100mW are available. Result: The widening of the STEREO base is increased without any additional electronic or amplifier.

- In all four channel versions a pre-amplifier out for SURROUND is available to add a wireless speaker system (e.g. FB206,FB208).

11-6

0014 E 3 1211 A 9 1360 D 6 2217 D 4 2298 D 4 2312 D 7 2346 E 7 3221 B 7 3242 C 1 3301 C 9 3314 D 7 5201 D 5 6208 C 4 6235 A 8 6305 D 8 7211 A 7 7301 C 9 9285 E 8 9298 D 6 9313 B 8 9329 B 7 9365 A 2
0225 D 2 1212 D 4 1361 D 8 2218 E 9 2299 D 4 2313 D 8 2374 B 9 3222 B 7 3243 A 8 3302 C 7 3316 D 8 5211 A 1 6209 C 1 6236 A 9 6306 D 7 7221 C 6 7302 C 7 9286 E 9 9299 D 5 9314 B 7 9330 D 8 9366 A 9
1008 A 3 1213 E 9 2200 E 5 2221 A 6 2301 C 9 2314 D 6 3201 B 1 3223 A 6 3244 A 8 3303 C 9 3317 C 8 5301 D 9 6210 C 1 6239 D 2 6307 D 8 7222 B 7 7303 C 9 9287 E 9 9300 B 8 9315 D 3 9331 D 7 9367 A 8
1200 B 1 1214 D 1 2202 E 4 2222 B 6 2302 C 7 2317 B 9 3202 C 4 3224 A 6 3246 A 8 3304 C 7 3321 A 9 5302 D 8 6211 B 1 6242 C 1 6308 E 6 7223 A 6 7304 D 9 9288 E 9 9301 A 4 9316 E 9 9335 A 8 9368 E 1
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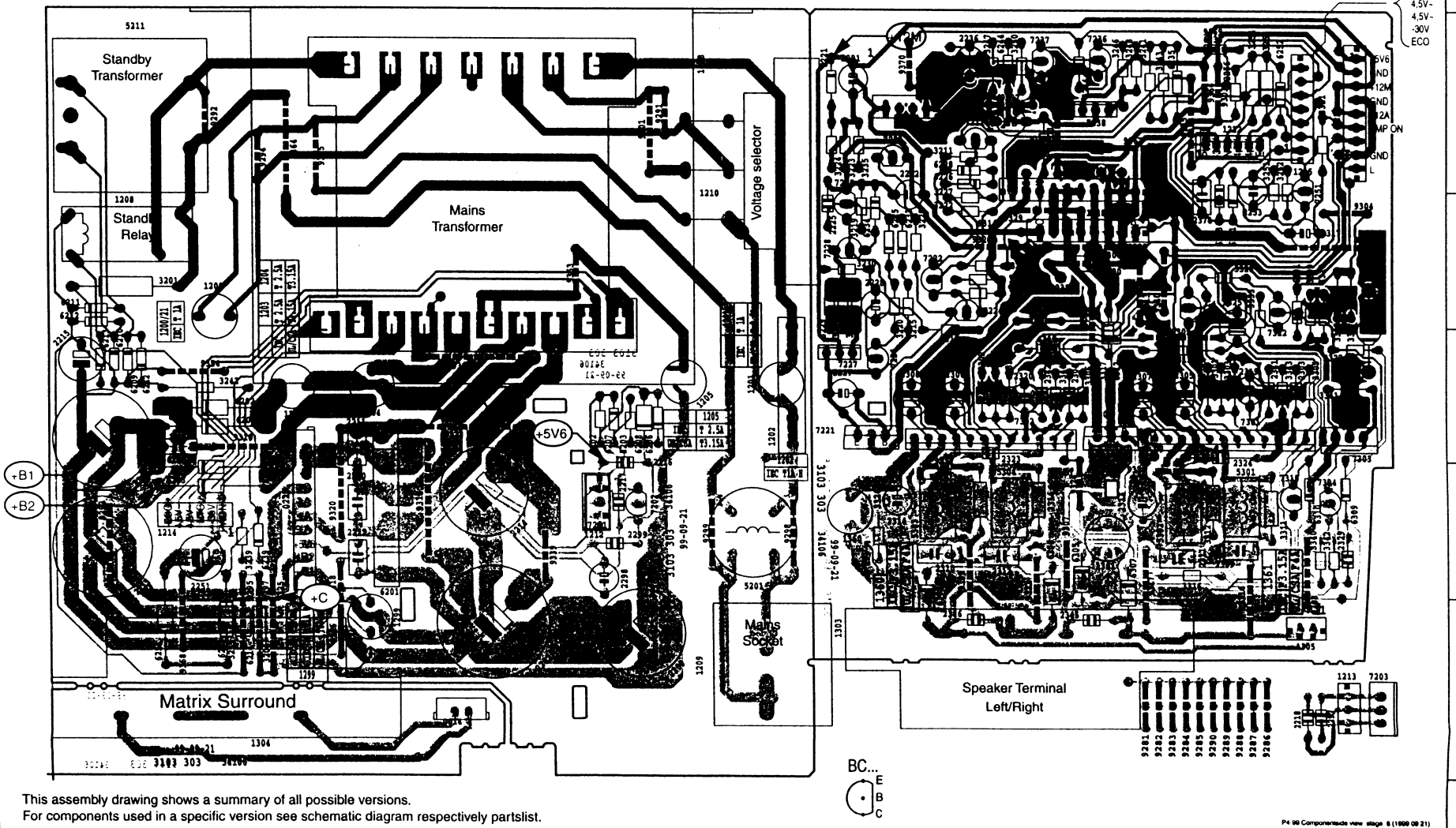
1202 C 5 1218 B 8 2206 C 1 2226 A 7 2304 C 8 2320 C 7 3204 E 2 3226 B 7 3248 A 8 3306 C 8 3327 C 9 5304 D 7 6213 C 1 6244 A 7 6310 D 9 7225 B 6 7315 D 9 9290 E 9 9303 A 9 9318 E 2 9338 B 8 9370 A 6
1203 C 2 1219 B 8 2210 D 2 2227 C 6 2305 C 8 2323 C 7 3211 A 7 3227 B 7 3250 A 7 3307 B 9 3328 B 9 6201 D 2 6214 E 1 6245 A 7 6312 C 8 7226 C 6 7316 B 8 9291 A 5 9304 B 9 9320 D 2 9339 D 4 9397 A 7
1204 C 2 1222 A 9 2211 C 2 2228 B 6 2306 C 7 2324 C 9 3215 B 6 3228 B 6 3251 A 9 3308 B 9 3333 B 9 6202 C 1 6221 A 6 6251 B 9 6313 C 8 7227 C 6 7322 B 9 9292 A 1 9305 C 8 9321 D 7 9340 B 8
1205 C 5 1235 A 6 2212 D 2 2236 A 7 2307 C 8 2325 B 9 3216 B 6 3229 B 6 3252 B 9 3309 B 9 3340 D 9 6203 D 1 6225 B 6 6252 A 9 6314 C 9 7228 B 6 8233 B 7 9293 D 1 9307 D 8 9322 B 9 9350 B 8
1207 B 8 1299 E 2 2213 D 1 2251 D 1 2308 C 6 2329 D 9 3217 B 6 3230 B 6 3253 A 9 3310 B 9 3341 C 9 6204 C 1 6226 A 7 6253 E 1 6315 C 7 7236 A 8 9281 E 8 9294 A 2 9308 D 9 9323 C 3 9353 B 4
1208 B 1 1303 E 7 2214 D 4 2252 D 1 2309 D 9 2341 C 9 3218 C 7 3235 A 6 3254 A 9 3311 D 9 3342 D 9 6205 D 1 6228 A 7 6254 E 1 7201 D 4 7237 A 7 9282 E 8 9295 E 1 9309 D 7 9324 D 8 9354 C 1
1209 E 5 1304 E 1 2215 C 1 2253 A 9 2310 D 7 2342 C 7 3219 B 6 3239 D 1 3255 E 1 3312 D 9 3343 C 9 6206 C 5 6233 B 6 6300 B 8 7202 D 4 7238 A 8 9283 E 8 9296 E 2 9310 C 1 9325 E 2 9361 B 7
1210 A 5 1305 E 9 2216 D 4 2297 E 9 2311 D 8 2345 E 8 3220 B 6 3241 A 8 3256 A 9 3313 D 7 3344 C 7 6207 C 4 6234 B 6 6301 B 9 7203 E 9 7251 A 9 9284 E 8 9297 E 2 9311 A 7 9328 B 7 9364 A 2

1 2 3 4 5 6 7 8 9

Componentside view

Supply Part

Amplifier Part Left/Right



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

P4 99 Componentside view stage 6 (1999 09 21)

A B C D E

1 2 3 4 5 6 7 8 9

11-8

9365 A 2	9329 B 7	9313 B 8	9298 D 6	9285 E 8	7301 C 9	7211 A 7	6305 D 8	6235 A 8	6208 C 4	5201 D 5	3314 D 7	3301 C 9	3242 C 1	3221 B 7	2346 E 7	2312 D 7	2298 D 4	2217 D 4	1360 D 6	1211 A 9	0014 E 3
9366 A 9	9330 D 8	9314 B 7	9299 D 5	9286 E 9	7302 C 7	7221 C 6	6306 D 7	6236 A 9	6209 C 1	5211 A 1	3316 D 8	3302 C 7	3243 A 8	3222 B 7	2374 B 9	2313 D 8	2299 D 4	2218 E 9	1361 D 8	1212 D 4	0225 D 2
9367 A 8	9331 D 7	9315 D 3	9300 B 8	9287 E 9	7303 C 9	7222 B 7	6307 D 8	6239 D 2	6210 C 1	5301 D 9	3317 C 8	3303 C 9	3244 A 8	3223 A 6	3201 B 1	2314 D 6	2301 C 9	2221 A 6	2200 E 5	1213 E 9	1008 A 3
9368 E 1	9335 A 8	9316 E 9	9301 A 4	9288 E 9	7304 D 9	7223 A 6	6308 E 6	6242 C 1	6211 B 1	5302 D 8	3321 A 9	3304 C 7	3246 A 8	3224 A 6	3202 C 4	2317 B 9	2303 C 7	2222 B 6	2202 E 4	1214 D 1	1200 B 1
9369 A 9	9336 B 8	9317 D 8	9302 C 3	9289 E 9	7305 C 8	7224 B 7	6309 D 9	6243 B 9	6212 B 1	5303 D 7	3326 D 6	3305 C 9	3247 A 7	3225 B 7	3203 C 4	2319 C 9	2303 C 9	2225 B 6	2204 C 1	1215 A 9	1201 C 5
9370 A 6	9338 B 8	9318 E 2	9303 A 9	9290 E 9	7315 D 9	7225 B 6	6310 D 9	6244 A 7	6213 C 1	5304 D 7	3327 C 9	3306 C 8	3248 A 8	3226 B 7	3204 E 2	2320 C 7	2304 C 8	2226 A 7	2206 C 1	1218 B 8	1202 C 5
9397 A 7	9339 D 4	9320 D 2	9304 B 9	9291 A 5	7316 B 8	7226 C 6	6312 C 8	6245 A 7	6214 E 1	6201 D 2	3328 B 9	3307 B 9	3250 A 7	3227 B 7	3211 A 7	2323 C 7	2305 C 8	2227 C 6	2210 D 2	1219 B 8	1203 C 2
	9340 B 8	9321 D 7	9305 C 8	9292 A 1	7322 B 9	7227 C 6	6313 C 8	6251 B 9	6221 A 6	6202 C 1	3333 B 9	3308 B 9	3251 A 9	3228 B 6	3215 B 6	2324 C 9	2306 C 7	2228 B 6	2211 C 2	1222 A 9	1204 C 2
	9350 B 8	9322 B 9	9307 D 8	9293 D 1	8233 B 7	7228 B 6	6314 C 9	6252 A 9	6225 B 6	6203 D 1	3340 D 9	3309 B 9	3252 B 9	3229 B 6	3216 B 6	2325 B 9	2307 C 8	2236 A 7	2212 D 2	1235 A 6	1205 C 5
	9353 B 4	9323 C 3	9308 D 9	9294 A 2	9281 E 8	7236 A 8	6315 C 7	6253 E 1	6226 A 7	6204 C 1	3341 C 9	3310 B 9	3253 A 9	3230 B 6	3217 B 6	2329 D 9	2308 C 6	2251 D 1	2213 D 1	1299 E 2	1207 B 8
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	9361 B 7	9325 E 2	9310 C 1	9296 E 2	9283 E 8	7238 A 8	7202 D 4	6300 B 8	6233 B 6	6206 C 5	3343 C 9	3312 D 9	3255 E 1	3239 D 1	3219 B 6	2342 C 7	2310 D 7	2253 A 9	2215 C 1	1304 E 1	1209 E 5
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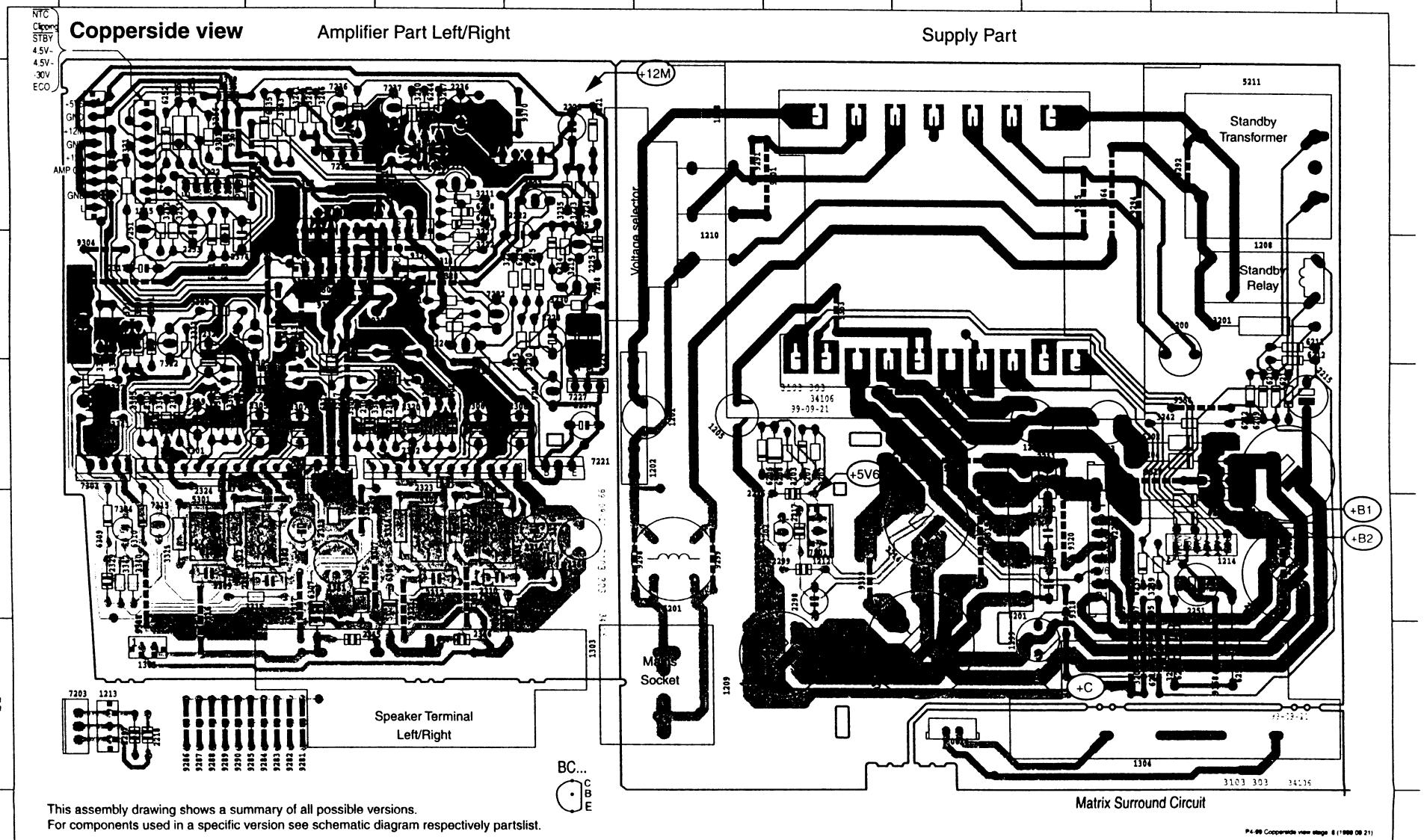
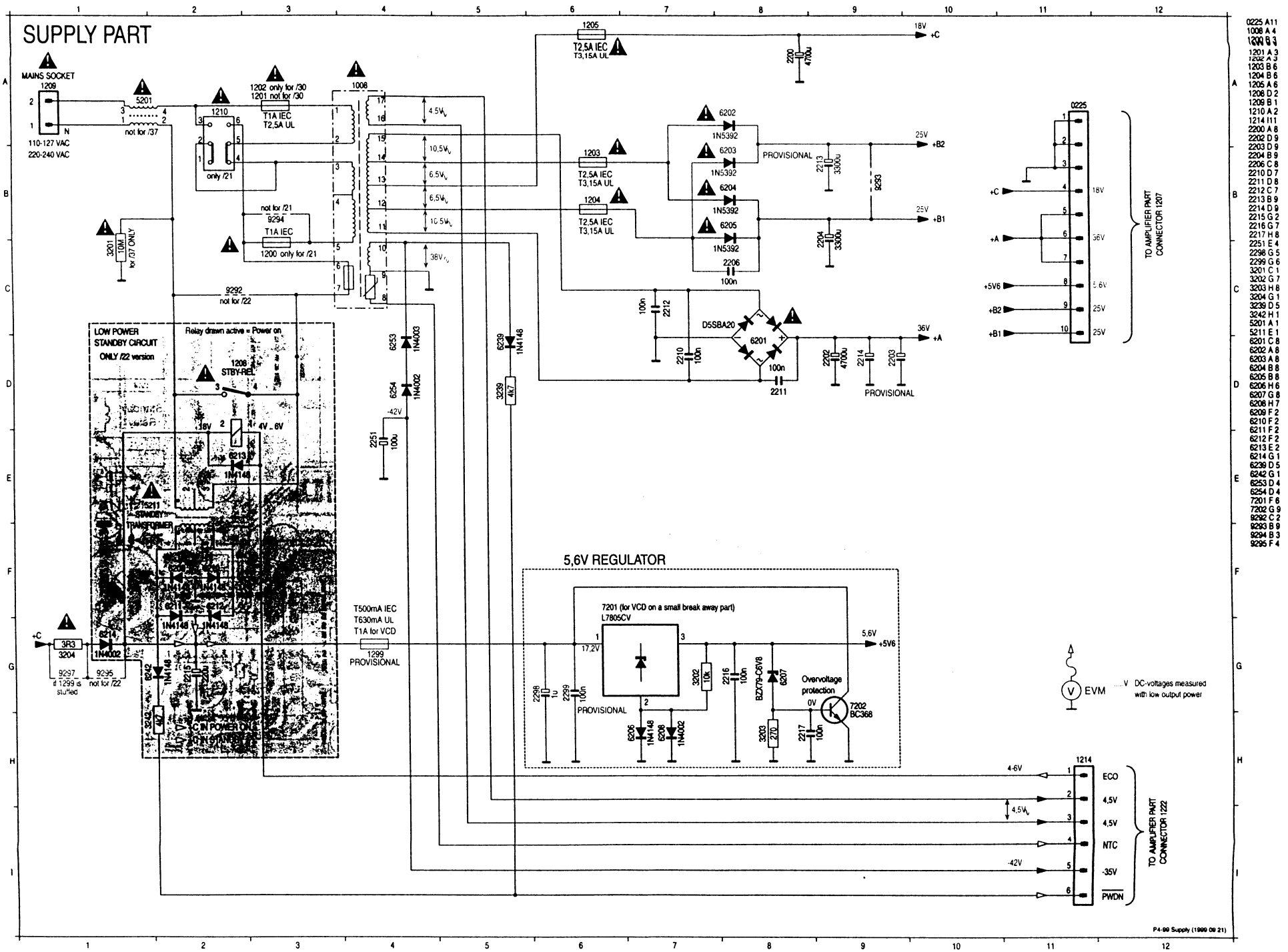
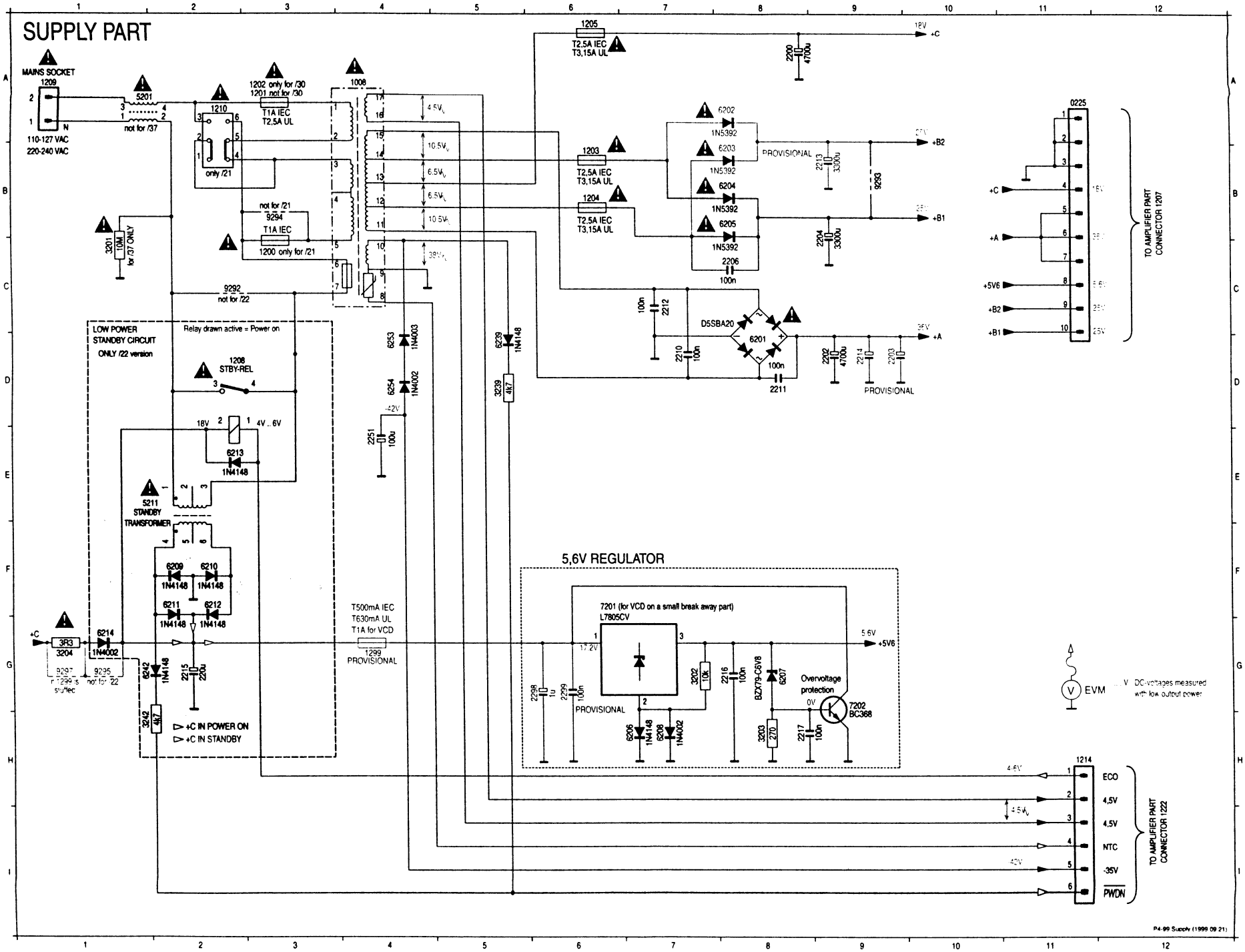


11-7

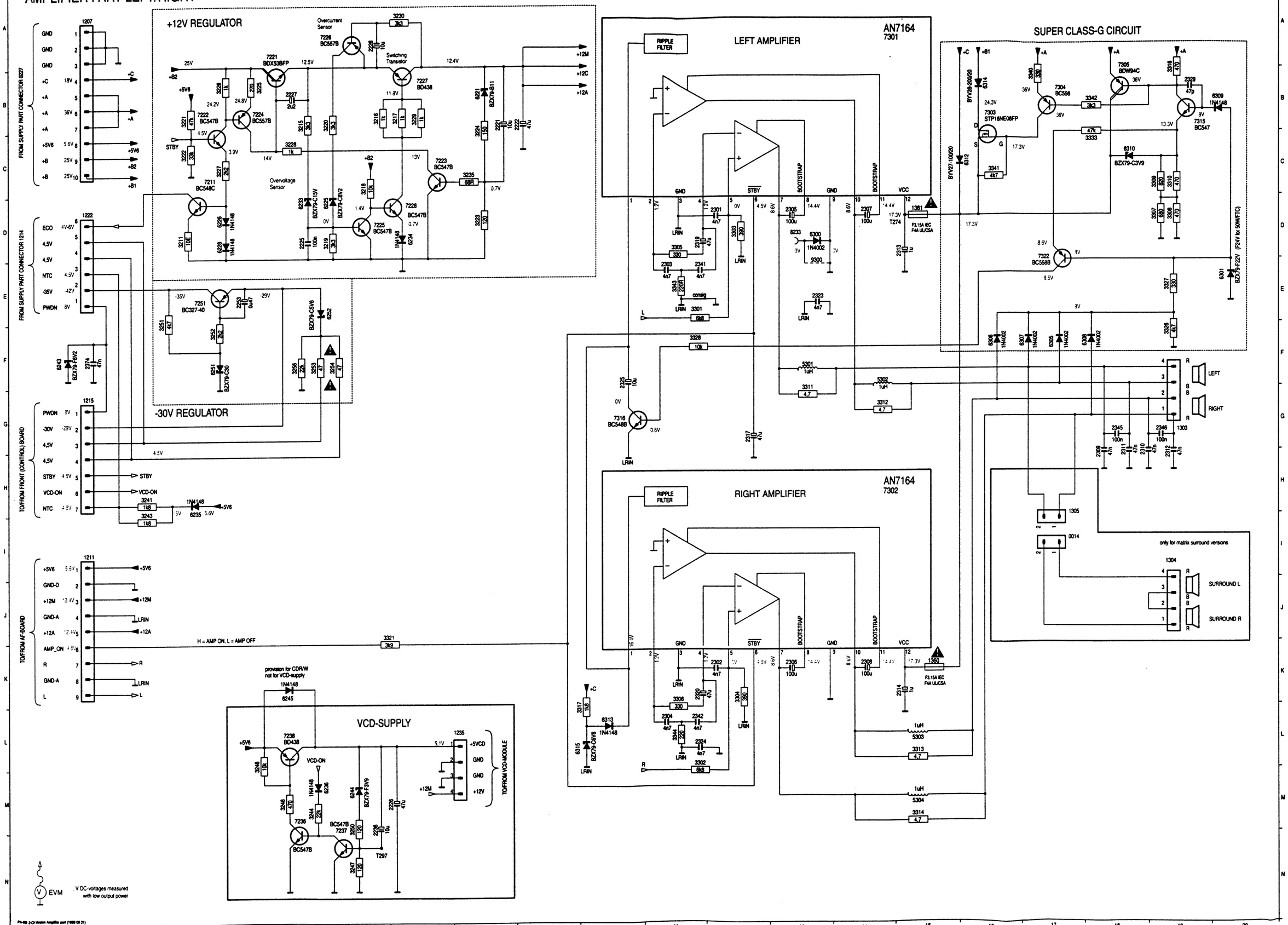

SUPPLY PART
MAINS SOCKET
110-127 VAC
220-240 VAC
not for /37
only /21
not for /21
1200 only for /21
not for /22
LOW POWER STANDBY CIRCUIT ONLY /22 version
Relay drawn active = Power on
STBY-REL
STANDBY TRANSFORMER
5,6V REGULATOR
7201 (for VCD on a small break away part)
L7805CV
Overvoltage protection
7202 BC368
PROVISIONAL
T500mA IEC
T630mA UL
T1A for VCD
D5SBA20
TO AMPLIFIER PART CONNECTOR 1207
TO AMPLIFIER PART CONNECTOR 1222
ECO
NTC
PWDN
EVM
DC-voltages measured with low output power
P4-00 Supply (1999 09 21)

11-7



0225 A11
1008 A 4
1200 B 3
1201 A 3
1202 A 3
1203 B 6
1204 B 6
1205 A 6
1209 B 1
1210 A 2
1214 I11
2200 A 8
2202 D 9
2203 D 9
2204 B 9
2206 C 8
2210 D 7
2211 D 8
2212 C 7
2213 B 9
2214 D 9
2215 G 2
2216 G 7
2217 H 8
2251 E 4
2298 G 5
2299 G 6
3201 C 1
3202 G 7
3203 H 8
3204 G 1
3239 D 5
3242 H 1
5201 A 1
5211 E 1
6201 C 8
6202 A 8
6203 A 8
6204 B 8
6205 B 8
6206 H 6
6207 G 8
6208 H 7
6209 F 2
6210 F 2
6211 F 2
6212 F 2
6213 E 2
6214 G 1
6239 D 5
6242 G 1
6253 D 4
6254 D 4
7201 F 6
7202 G 9
9292 C 2
9293 B 9
9294 B 3
9295 F 4

AMPLIFIER PART LEFT/RIGHT



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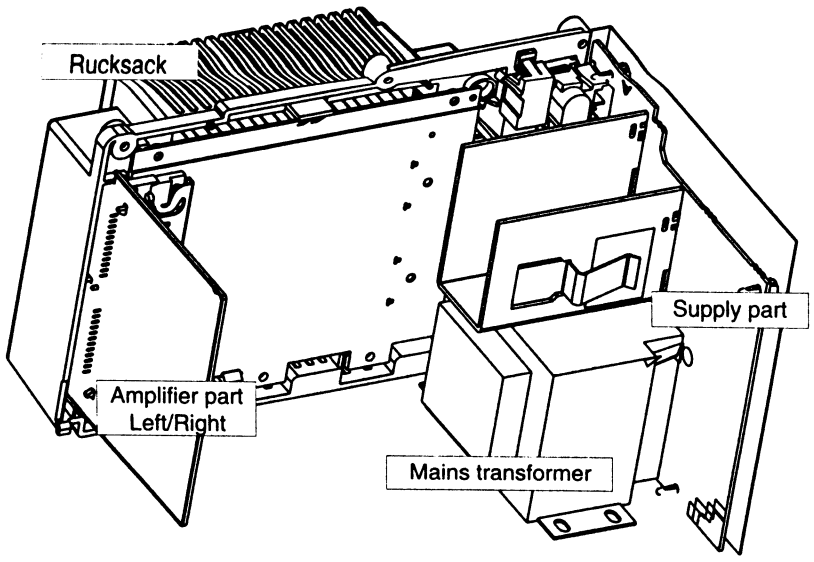
1211 I 2
1215 G 2
1218 M20
1219 M20
1222 D 2
1235 L 7
1303 G19
1304 I19
1305 I17
1360 K15
1361 D15
2221 B 8
2222 B 9
2225 D 5
2226 M 7
2227 B 5
2228 A 6
2236 M 6
2253 E 4
2301 D12
2302 K12
2303 E11
2304 L11
2305 D13
2306 K13
2307 D14
2308 K14
2309 H18
2310 H18
2311 H18
2312 H19
2313 D15
2314 K15
2317 G12
2319 D11
2320 K11
2323 E13
2324 L11
2325 F10
2329 B19
2341 E11
2342 L11
2345 G18
2346 G19
2374 F 2
3211 D 3
3215 B 5
3216 B 6
3217 B 7
3218 C 6
3219 D 6
3220 B 6
3221 B 3
3222 C 3
3223 D 6
3224 B 8
3225 B 4
3226 B 4
3227 C 4
3228 C 5
3229 B 7
3230 A 7
3235 C 8
3241 H 3
3243 H 3
3244 M 5
3246 M 5
3247 N 6
3248 L 4
3250 M 6
3251 E 3
3252 F 4
3253 F 5
3254 F 6
3256 F 5
3301 E11
3302 L11
3303 D12
3304 K12
3305 D11
3306 K11
3307 D19
3308 D19
3309 C19
3310 C19
3311 G13
3312 G14
3313 L15
3314 M15
3316 B19
3317 L10
3321 J 6
3326 F19
3327 E19
3328 F11
3333 C18
3340 B17
3341 C16
3342 B18
3343 E11
3344 L11
5301 F13
5302 F14
5303 L15
5304 M15
6221 B 8
6225 D 6
6226 D 4
6228 D 4
6233 D 5
6234 D 7
6235 H 3
6236 M 5
6243 F 1
6244 M 6
6245 K 5
6251 F 4
6252 E 5
6300 D13
6301 E20
6305 F17
6306 F16
6307 F17
6308 F18
6309 B20
6310 C18
6312 C16
6313 L10
6314 B16
6315 L 9
7211 C 4
7221 A 5
7222 B 3
7223 C 7
7224 B 4
7225 D 6
7226 A 5
7227 B 7
7228 D 7
7236 M 5
7237 M 6
7238 L 5
7251 E 3
7301 A15
7302 H15
7303 B16
7304 B17
7305 B18
7315 B19
7316 G10
7322 E17
9283 D13
9281 K17
9282 K17
9283 L17
9284 L17

PARTS LIST POWER 4 MODULE



MECHANICAL PARTS LIST - POWER 4 MODULE

201	482242610607	Rucksack	215	482249211735	Spring Transistor
201	482242610608	Rucksack With Matrix Surround	253	482249211068	Clamping Spring
			255	482225540179	Spring Clip

ELECTRICAL PARTS LIST - POWER 4 MODULE

MISCELLANEOUS

1200	482207151002	⚠	Fuse T1A
1201	482207151002	⚠	Fuse T1A
1201	482225350137	⚠	Fuse T2,5A UL
1202	482225211224	⚠	Fuse T1A
1203	482207152502	⚠	Fuse T2,5A
1203	482225251121	⚠	Fuse T3,15A UL
1204	482207152502	⚠	Fuse T2,5A
1204	482225251121	⚠	Fuse T3,15A UL
1205	482207152502	⚠	Fuse T2,5A
1205	482225251121	⚠	Fuse T3,15A UL
1207	482226710557		Connector
1208	242213207402	⚠	Relay
1209	482226531015	⚠	Mains Socket, IEC
1209	482226531016	⚠	Mains Socket, UL
1210	482227210269	⚠	Voltage Selector
1299	482207151002	⚠	Fuse T1A
1303	482226731176		Speaker Terminal
1304	482226510912		Matrix Surround Terminal
1360	482225211225	⚠	Fuse F3,15A IEC 250V
1360	482225211226	⚠	Fuse F4A UL 250V
1361	482225211225	⚠	Fuse F3,15A IEC 250V
1361	482225211226	⚠	Fuse F4A UL 250V

CAPACITORS

2200	482212480103	4700µF 20% 25V
2202	482212480415	4700µF 20% 50V
2204	482212442367	3300µF 20% 35V
2206	532212142386	100nF 5% 63V
2210	532212142386	100nF 5% 63V
2211	532212142386	100nF 5% 63V
2212	532212142386	100nF 5% 63V
2215	482212480144	220µF 20% 25V
2216	482212612882	100nF +80/-20% 50V
2217	482212612882	100nF +80/-20% 50V
2221	482212441579	10µF 20% 50V
2222	482212440433	47µF 20% 25V
2225	482212612882	100nF +80/-20% 50V
2226	482212440433	47µF 20% 25V
2227	482212441576	2,2µF 20% 50V
2228	482212441579	10µF 20% 50V
2236	482212441579	10µF 20% 50V
2251	482212440255	100µF 20% 63V
2253	482212441407	0,47µF 20% 63V
2298	482212440242	1µF 20% 63V
2299	482212612882	100nF +80/-20% 50V
2301	482212611714	4,7nF 20%

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ELECTRICAL PARTS LIST - POWER 4 MODULE

CAPACITORS

2302	482212611714		4,7nF 20%
2303	482212611714		4,7nF 20%
2304	482212611714		4,7nF 20%
2305	482212481029		100µF 20% 25V
2306	482212481029		100µF 20% 25V
2307	482212481029		100µF 20% 25V
2308	482212481029		100µF 20% 25V
2309	482212143526		47nF 5% 250V
2310	482212143526		47nF 5% 250V
2311	482212143526		47nF 5% 250V
2312	482212143526		47nF 5% 250V
2313	482212440242		1µF 20% 63V
2314	482212440242		1µF 20% 63V
2317	482212440433		47µF 20% 25V
2319	482212440433		47µF 20% 25V
2320	482212440433		47µF 20% 25V
2323	482212611714		4,7nF 20%
2324	482212611714		4,7nF 20%
2325	482212441579		10µF 20% 50V
2329	482212233848		47pF 5% 50V
2341	482212611714		4,7nF 20%
2342	482212611714		4,7nF 20%
2345	482212612882		100nF +80/-20% 50V
2346	482212612882		100nF +80/-20% 50V
2374	482212143526		47nF 5% 250V

RESISTORS

3201	482205321106	⚠	10M 5% 0,5W
3202	482211683864		10k 5% 0,5W
3203	482211683876		270R 5% 0,5W
3204	482205210338	⚠	3R3 5% 0,33W
3211	482211652176		10R 5% 0,5W
3215	482211652269		3k3 5% 0,5W
3216	482205011002		1k 1% 0,4W
3217	482205011002		1k 1% 0,4W
3218	482211683864		10k 5% 0,5W
3219	482211652269		3k3 5% 0,5W
3220	482211652269		3k3 5% 0,5W
3221	482211683884		47k 5% 0,5W
3222	482211652271		33k 5% 0,5W
3223	482211652206		120R 5% 0,5W
3224	482211683868		150R 5% 0,5W
3225	482211683876		270R 5% 0,5W
3226	482205011002		1k 1% 0,4W
3227	482211652256		2k2 5% 0,5W
3228	482205011002		1k 1% 0,4W
3229	482205011002		1k 1% 0,4W
3230	482211652269		3k3 5% 0,5W
3235	482211652199		68R 5% 0,5W
3239	482211652283		4k7 5% 0,5W
3241	482211652249		1k8 5% 0,5W
3242	482211652283		4k7 5% 0,5W
3243	482211652249		1k8 5% 0,5W
3244	482211652257		22k 5% 0,5W
3246	482211683883		470R 5% 0,5W
3247	482211652206		120R 5% 0,5W
3248	482211683864		10k 5% 0,5W
3250	482211652206		120R 5% 0,5W
3251	482211652283		4k7 5% 0,5W
3252	482211652256		2k2 5% 0,5W
3253	482205210479	⚠	47R 5% 0,33W
3254	482205210479	⚠	47R 5% 0,33W
3255	482211712148		1R5 5%
3301	482211683961		6k8 5%
3302	482211683961		6k8 5%
3303	482211683881		390R 5% 0,5W
3304	482211683881		390R 5% 0,5W
3305	482211652219		330R 5% 0,5W
3306	482211652219		330R 5% 0,5W
3307	482211652228		680R 5% 0,5W
3308	482211652228		680R 5% 0,5W
3309	482211652231		820R 5% 0,5W
3310	482211652231		820R 5% 0,5W
3311	482205024708		4R7 1% 0,6W
3312	482205024708		4R7 1% 0,6W
3313	482205024708		4R7 1% 0,6W
3314	482205024708		4R7 1% 0,6W
3316	482211683883		470R 5% 0,5W
3317	482211652249		1k8 5% 0,5W
3321	482211652276		3k9 5% 0,5W
3326	482211652283		4k7 5% 0,5W
3327	482211652219		330R 5% 0,5W
3328	482211683864		10k 5% 0,5W
3333	482211683884		47k 5% 0,5W
3340	482211652219		330R 5% 0,5W
3341	482211652283		4k7 5% 0,5W
3342	482211652269		3k3 5% 0,5W
3343	482211683872		220R 5% 0,5W
3344	482211683872		220R 5% 0,5W

COILS & FILTERS

5201	482215711832	⚠	Mains Filter 400µH 3A
5211	482214610756	⚠	Standby Transformer
5211	310330830590	⚠	Standby Transformer
5301	482215762255		Coil 18,5 Turns
5302	482215762255		Coil 18,5 Turns
5303	482215762255		Coil 18,5 Turns
5304	482215762255		Coil 18,5 Turns

DIODES

6201	482213082078	⚠	D5SBA20
6204	532213080686	⚠	1N5392
6205	532213080686	⚠	1N5392
6206	482213030621		1N4148
6207	482213034278		BZX79-C6V8
6208	482213031878		1N4003G

ELECTRICAL PARTS LIST - POWER 4 MODULE

DIODES

6209	482213030621	1N4148
6210	482213030621	1N4148
6211	482213030621	1N4148
6212	482213030621	1N4148
6213	482213030621	1N4148
6214	482213031878	1N4003G
6221	482213034488	BZX79-B11
6225	482213034382	BZX79-C8V2
6226	482213030621	1N4148
6228	482213030621	1N4148
6233	482213034281	BZX79-C15
6234	482213030621	1N4148
6235	482213030621	1N4148
6236	482213030621	1N4148
6239	482213030621	1N4148
6242	482213030621	1N4148
6243	482213034382	BZX79-B8V2
6244	482213031981	BZX79-B3V9
6251	482213034328	BZX79-C30
6252	482213034173	BZX79-C5V6
6253	482213031878	1N4003G
6254	482213031878	1N4003G
6300	482213031878	1N4003G
6301	482213034441	BZX79-B22
6301	933887290673	BZX55-F24
6305	482213031878	1N4003G
6306	482213031878	1N4003G
6307	482213031878	1N4003G
6308	482213031878	1N4003G
6309	482213030621	1N4148
6310	482213031981	BZX79-C3V9
6312	482213031982	BYV27-100
6313	482213030621	1N4148
6314	482213080791	BYV28-200/20
6315	482213034278	BZX79-C6V8

TRANSISTORS & INTEGRATED CIRCUITS

7201	482220980817	L7805CV
7202	933259240126	BC368
7211	482213044503	BC547C
7221	932213923687	BDX53BFP
7222	482213040959	BC547B
7223	482213040959	BC547B
7224	482213041691	BC556B
7225	482213040959	BC547B
7226	482213041691	BC556B
7227	482213040995	BD438
7228	482213040959	BC547B
7236	482213040959	BC547B
7237	482213040959	BC547B
7238	482213040995	BD438
7251	482213041327	BC327-40
7301	482220990411	AN7164
7302	482220990411	AN7164
7303	482213011336	STP16NE06FP
7304	482213041691	BC556B
7305	482213010847	BDW94C
7315	482213040959	BC547B
7316	482213040959	BC547B
7322	482213044568	BC557B

Note : Only the parts mentioned in this list are normal service spare parts.

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AF6 BOARD

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BRIEF INTRODUCTION OF THE AF6 BOARD

The AF6 Board consists of the following features :

a. SOFAC IC

SOFAC IC TEA6321 (7511) which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I²C Bus from the microprocessor.

The SOFAC IC caters for 4 input sources, namely tuner, tape, CD and AUX.
It also has a MONO input which is tied to ground via a capacitor. In our application, software will switch the input source to previous source MUTE during STANDBY mode and some other occasions where noise from other input source is undesirable.
Note that the input to the SOFAC IC must be ac coupled to prevent 'plop' noise.
Input networks are included to provide appropriate attenuation for various sources.

b. KARAOKE MIC. MIXING

The AF6 Board has provisions which can be configured to cater for one of the following:
NK : Non-Karaoke.
SK : Simple Karaoke which caters for single mic. mixing with additional mic. amplifier board.
FK : Full Karaoke which caters for double mic. mixing with additional mic. amplifier board.

c. DOLBY PRO LOGIC (DPL) INTERFACE

The AF6 Board has provisions which can be configured to cater for Dolby Pro Logic (DPL).

d. LINE OUT

Line out with cinch socket for connection to external amplifier.

e. SUB-WOOFER OUT

Sub-woofer out with cinch socket for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND

Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER

Headphone Amplifier to drive 32 ohm to 1kohm headphone.

h. CD STANDBY CONTROL

CD Standby Control circuit which switches on the supply to CD servo control IC, HF circuit and the laser light pen in CD mode only.

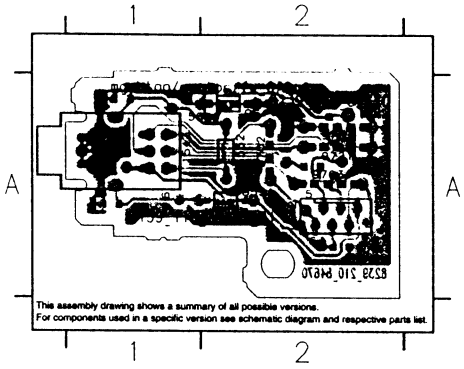
i. ATTENUATION NETWORK

Attenuation network is provided at the output of the AF6 Board for interfacing with power board of different output power.

12-1

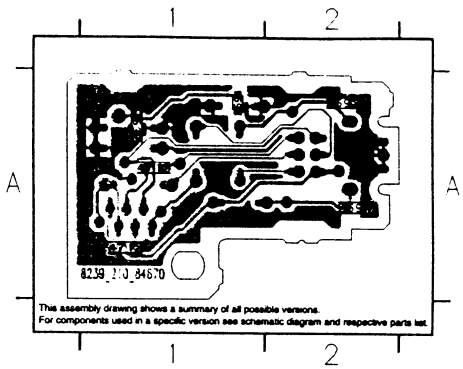
HEADPHONE BOARD - COMPONENT LAYOUT

1542 A2 1543 A1 1544 A2 5523 A2 5531 A2 5532 A2 9641 A2 9701 A2 9702 A2 9703 A2 9721 A2


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

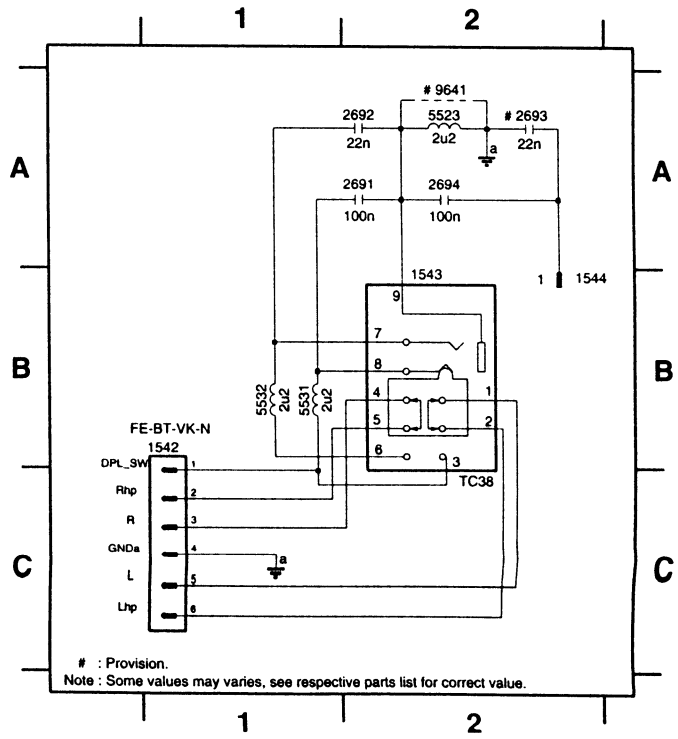
HEADPHONE BOARD - CHIP LAYOUT

2691 A2 2692 A2 2693 A1 2694 A1 4712 A1 4713 A1


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

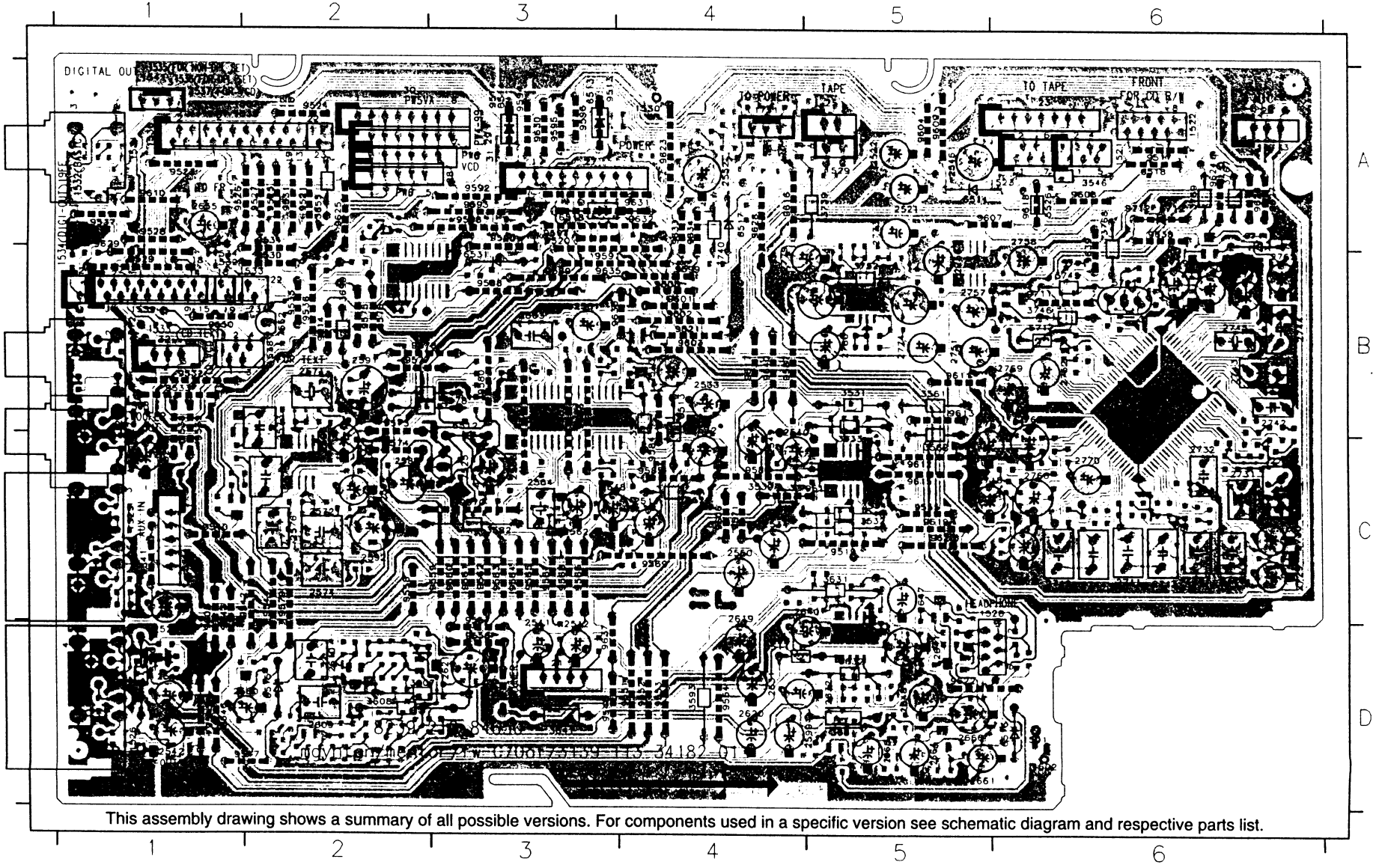
HEADPHONE BOARD - CIRCUIT DIAGRAM

1542 B1 1544 B2 2692 A2 2694 A2 5531 B1 9641 A2
1543 B2 2691 A2 2693 A2 5523 A2 5532 B1



AF6 BOARD - COMPONENT LAYOUT

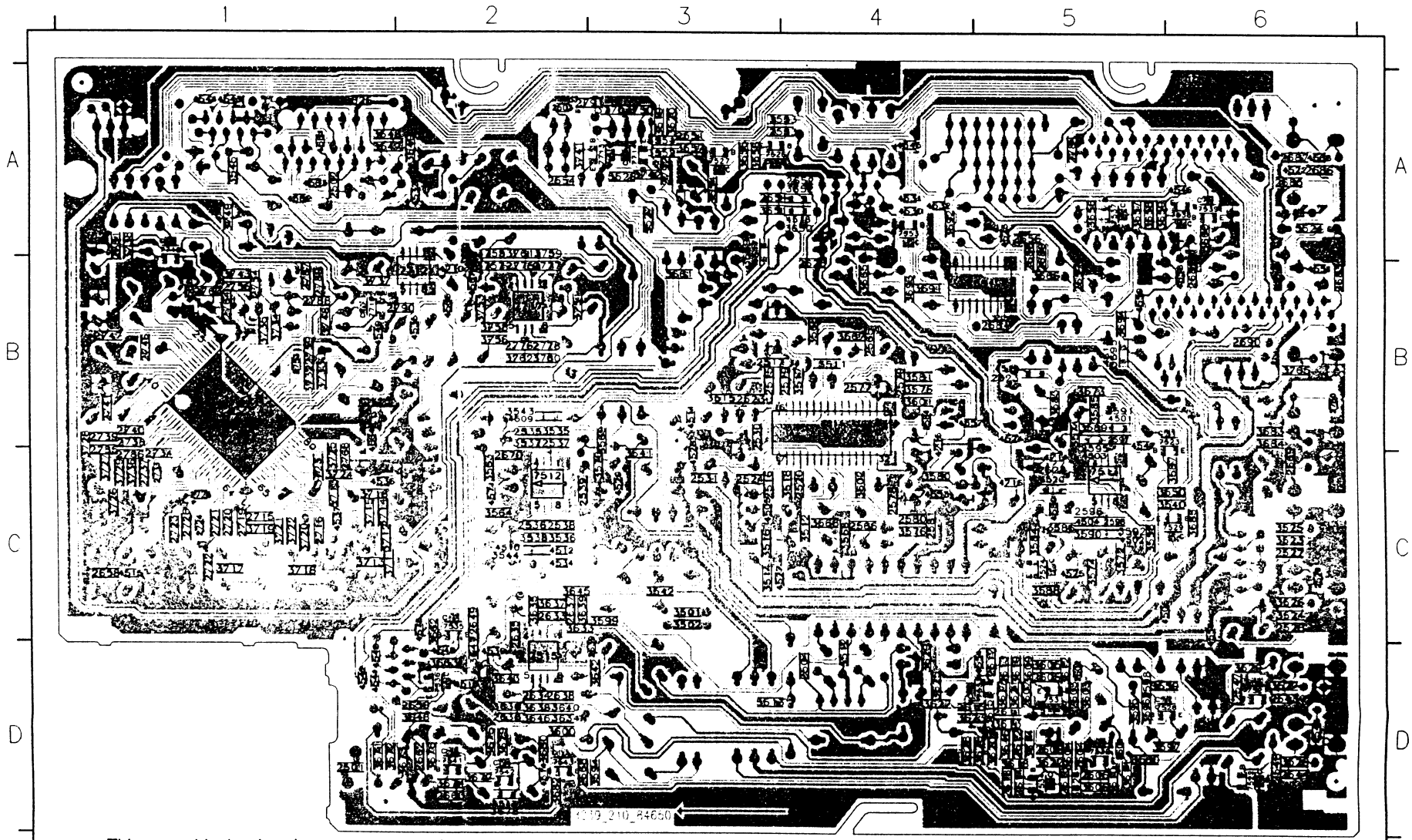
21 D3 1522 A6 1537 A2 2526 D1 2563 B3 2599 D5 2664 D5 2732 C6 2762 B6 3522 C4 3607 D2 3768 A6 6531 B3 9524 A2 9538 B1 9552 D4 9566 C3 9581 B3 9595 A3 9609 A5 9623 A4 9637 D3
23 A6 1523 A6 1538 B2 2532 B4 2564 C3 2609 D2 2665 D5 2735 C6 2765 B6 3530 D1 3608 D2 3769 A6 6711 A6 9525 A2 9539 B1 9553 D4 9567 C3 9582 B3 9596 A3 9610 A1 9624 A6 9638 A6
24 C1 1525 C1 1539 B1 2533 B4 2571 B2 2610 D2 2666 D5 2742 B6 2766 C6 3531 B5 3631 C5 5511 D4 6712 A6 9526 A1 9540 C1 9554 D4 9568 C3 9583 B3 9597 A3 9611 B5 9625 A2 9639 B6
25 A5 1526 D1 1541 A1 2534 C4 2572 C2 2619 C4 2711 C6 2743 B6 2767 B5 3532 C5 3632 D5 5526 A6 7525 C3 9527 A2 9541 C1 9555 C5 9569 C4 9584 C4 9598 A3 9612 C5 9626 A6 9640 B4
26 A6 1527 C1 1711 A4 2540 B4 2573 B2 2620 D4 2712 C6 2744 B6 2769 B6 3533 C5 3641 D3 5711 B6 7552 B2 9528 A1 9542 C1 9556 D3 9570 C3 9585 C4 9599 B4 9613 B5 9627 A6 9711 B6
27 A3 1528 C5 1712 B1 2541 D1 2574 C2 2621 D3 2713 C6 2745 B6 2770 C6 3534 C5 3655 A2 5712 B6 9511 C5 9529 B1 9543 C1 9557 C3 9571 C4 9586 C4 9600 B4 9614 B3 9628 A1 9712 A6
28 A3 1529 A5 2511 D3 2542 D1 2575 C2 2631 D4 2714 C6 2748 B6 2771 B4 3539 C4 3681 D5 6511 A5 9513 A3 9530 B2 9544 C2 9558 C2 9573 B2 9587 B4 9601 B4 9615 C5 9629 A1
29 A3 1530 A4 2512 D3 2546 A5 2576 C2 2632 D5 2717 C6 2749 B6 2772 B5 3546 A6 3699 B2 6512 B3 9514 A3 9531 A2 9545 D1 9559 C3 9574 C2 9588 B3 9602 B4 9616 A4 9630 A3
30 A2 1531 A1 2513 B4 2549 C4 2582 C2 2640 C5 2718 C5 2750 B6 2773 A5 3561 B5 3739 A5 6513 A3 9517 A6 9532 B1 9546 D1 9560 C3 9575 B2 9589 B3 9603 B4 9617 B4 9631 A4
31 A3 1532 B1 2514 C4 2550 C4 2583 C3 2641 D5 2727 C6 2751 B5 2774 B5 3562 C5 3740 B4 6514 A3 9518 A6 9533 B1 9547 D2 9561 C3 9576 B2 9590 A3 9604 A5 9618 A6 9632 A4
32 B1 1533 B2 2518 C3 2552 A4 2591 B2 2647 C5 2728 C6 2752 B6 2779 B4 3577 B3 3745 B6 6515 D2 9519 C5 9534 A2 9548 D3 9562 C3 9577 B2 9591 B3 9605 C1 9619 C5 9633 A4
1501 D6 1534 B1 2521 A5 2560 D2 2592 C2 2648 D5 2729 C6 2756 B5 2780 B5 3578 B3 3746 B6 6516 D6 9520 A3 9535 B2 9549 D3 9563 C3 9578 B2 9592 A3 9606 C4 9620 C5 9634 A4
1502 D6 1535 A2 2522 A5 2561 B3 2593 C2 2655 A1 2730 C6 2757 B5 3513 B4 3582 C3 3752 B5 6517 A4 9521 A2 9536 B2 9550 B1 9564 C3 9579 C2 9593 A3 9607 A5 9621 B4 9635 B3
1521 A6 1536 A1 2525 C1 2562 C3 2594 C2 2661 D5 2731 C6 2758 A6 3521 B4 3593 D4 3767 A6 6518 A3 9523 A1 9537 A1 9551 D4 9565 C3 9580 B3 9594 A3 9608 A6 9622 D5 9636 B3



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

AF6 BOARD - CHIP LAYOUT

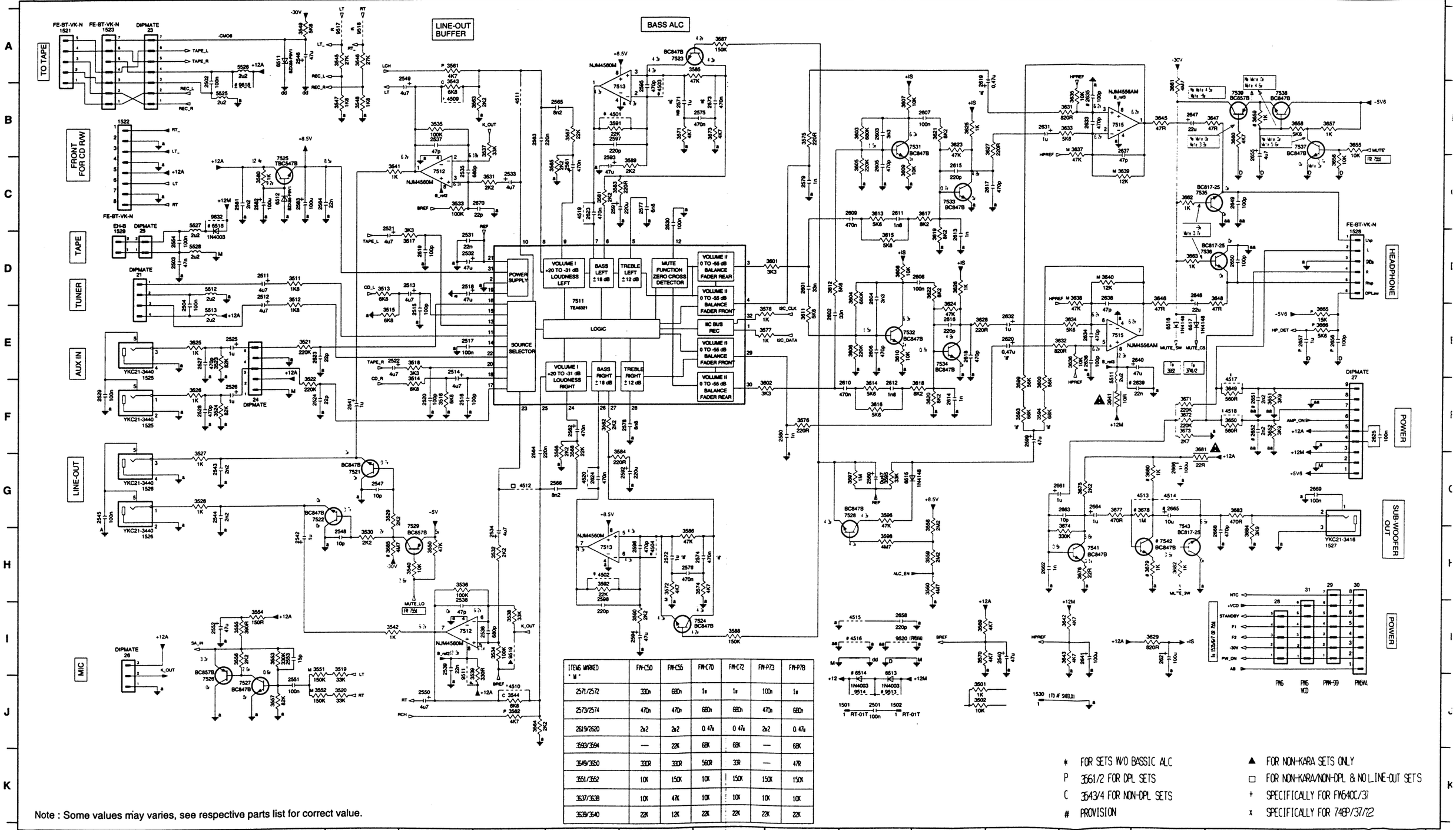
2501 D1 2538 C2 2596 C5 2623 B5 2668 D2 2724 C1 2764 B1 3514 C3 3541 C3 3563 C2 3586 C5 3606 D5 3627 D4 3651 A3 3678 D2 3718 C1 3741 A2 4502 C5 4524 B5 4545 A4 4571 C2 7513 C5 7541 D2
2502 A1 2539 C2 2597 B5 2624 C5 2669 C6 2725 C1 2768 C1 3515 B3 3542 C3 3564 C2 3587 C6 3609 D5 3628 D4 3652 A4 3679 D2 3719 C1 3742 A3 4503 C5 4525 C5 4546 A6 4573 C2 7515 D2 7542 D2
2503 A2 2543 D6 2598 C5 2625 B4 2670 C2 2726 C1 2775 B2 3516 C3 3543 B2 3565 B4 3588 C5 3610 D5 3629 D4 3656 A5 3680 D2 3720 C1 3743 B1 4504 C5 4527 C3 4547 B5 4580 C5 7521 D6 7543 D2
2504 D4 2544 D6 2601 D5 2633 C2 2681 B5 2733 C1 2776 B2 3517 B4 3544 C2 3566 C4 3589 B5 3611 D5 3633 C2 3657 A5 3682 D2 3721 C1 3748 B1 4505 C3 4528 C3 4548 D2 4611 B5 7522 D6 7551 B5
2515 B3 2545 D6 2602 D5 2634 D2 2682 B6 2734 C1 2777 B2 3518 C4 3545 A1 3567 B4 3590 C5 3612 D5 3634 D2 3658 A5 3683 B6 3722 C1 3749 A1 4506 C5 4529 C3 4549 B1 4664 B1 7523 B6 7553 A4
2516 C3 2547 D6 2603 D5 2635 C2 2683 B6 2737 C1 2778 B2 3519 A3 3547 A1 3568 C4 3591 B5 3613 D5 3635 C2 3659 A5 3684 B6 3723 C1 3750 A3 4509 B2 4530 A4 4551 B6 4710 B2 7524 C5 7711 B1
2517 B3 2548 D6 2604 D5 2636 D2 2685 A6 2738 B1 2781 A5 3520 A3 3548 A1 3569 B3 3592 C5 3614 D5 3636 D2 3660 A6 3685 C6 3724 C1 3751 B2 4510 C2 4531 A4 4553 C4 4711 A3 7526 A3 7712 B2
2519 B4 2551 A3 2605 D5 2637 C2 2686 A6 2739 B1 2785 C1 3523 C6 3549 A2 3570 C3 3594 D3 3615 D5 3637 C2 3661 B3 3691 B4 3725 C1 3753 B2 4511 B3 4532 A4 4554 D5 4714 C5 7527 A3 7713 A3
2520 C4 2553 A4 2606 D5 2638 D2 2687 A6 2740 B1 2786 C1 3524 C6 3550 C6 3571 B5 3595 D5 3616 D5 3638 D2 3662 C2 3692 A4 3726 C1 3755 A2 4512 C2 4533 A2 4556 C6 4715 B4 7528 D5 7714 A3
2523 B3 2554 A2 2607 D5 2639 D2 2688 A5 2741 B1 2787 B1 3525 C6 3551 A3 3572 C5 3596 D5 3617 D5 3639 C2 3663 D2 3693 B4 3727 C1 3756 B2 4513 D2 4534 C2 4557 B4 4716 C5 7529 C6 7715 A1
2524 C3 2565 B4 2608 D5 2649 C2 2689 A5 2746 B1 2788 B1 3526 C6 3552 A3 3573 B5 3597 D5 3618 D5 3640 D2 3665 B4 3694 B5 3728 B1 3757 B2 4514 D2 4535 B2 4558 B6 5512 D4 7531 D5 7716 B1
2527 C6 2566 C4 2611 D5 2650 D2 2690 B6 2747 B1 2789 B1 3527 D6 3553 A4 3574 C5 3598 D5 3619 D5 3642 D3 3666 B5 3695 B5 3729 C1 3758 B2 4515 C1 4536 C1 4559 B5 5513 D3 7532 D5 7717 B2
2528 C6 2577 B4 2612 D5 2651 A3 2715 C1 2753 B1 2790 B2 3528 D6 3554 A3 3575 B4 3599 C3 3620 D5 3643 D2 3671 D1 3711 C1 3732 B1 3759 A2 4516 D2 4537 C1 4561 A1 5524 A6 7533 D5
2529 C6 2578 C4 2613 D5 2652 A4 2716 C1 2754 B1 2791 A3 3529 D6 3555 A3 3576 C4 3600 D2 3621 D5 3645 C2 3672 D1 3712 C1 3733 B1 3760 B2 4517 A3 4539 D2 4562 A1 5525 A1 7534 D5
2530 B3 2579 B4 2614 D5 2656 A5 2719 C1 2755 B1 2792 A3 3535 B2 3556 A3 3580 C4 3601 B4 3622 D5 3646 D2 3673 D2 3713 C1 3734 B1 3761 A2 4518 A4 4540 D1 4563 A1 5527 A3 7535 C2
2531 C3 2580 C4 2615 D4 2657 B5 2720 C1 2759 B1 3501 C3 3536 C2 3557 A3 3581 B4 3602 C4 3623 D4 3647 D2 3674 D2 3714 C1 3735 B1 3762 B2 4519 B5 4541 D1 4565 B1 5528 A3 7536 D2
2535 B2 2581 C4 2616 D5 2658 C1 2721 C1 2760 B6 3502 C3 3537 B2 3558 C5 3583 B5 3603 D5 3624 D5 3648 D2 3675 D2 3715 C1 3736 C1 3765 B6 4520 C5 4542 D1 4566 B2 5713 C1 7537 A5
2536 C2 2584 B4 2617 D5 2662 D2 2722 C1 2761 A1 3511 B4 3538 C2 3559 D5 3584 C5 3604 D5 3625 D4 3649 A3 3676 D2 3716 C1 3737 B1 3770 A3 4522 A6 4543 A1 4567 B2 7511 B4 7538 A6
2537 B2 2595 B5 2618 D5 2663 D2 2723 C1 2763 B1 3512 C4 3540 C6 3560 D5 3585 B5 3605 D5 3626 D5 3650 A4 3677 D2 3717 C1 3738 A1 4501 B5 4523 A5 4544 A1 4568 A6 7512 C2 7539 A6



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

AF6 BOARD - CIRCUIT DIAGRAM (PART 1)

21 D2	31 H16	1526 H2	2511 D4	2530 F6	2529 F1	3536 I6	3547 G6	3561 C6	2574 H10	2583 C4	2598 I6	2609 D13	2617 C14	3532 E14	2641 I16	2657 E16	2666 G16	3616 F6	3625 E3	3634 I7	3643 B6	3652 J4	3661 A6	3670 I13	3680 C4	3689 C9	3696 H12	3607 B12	3616 F12	3625 I13	3635 E16	3646 B16	3656 C16	3666 E16	3679 H16	4603 B6	4616 I12	5630 A3	6517 E16	7521 G6	7531 B12	7541 H16	9530 I12
23 A2	1501 J12	1527 H16	2512 D4	2531 D6	2530 C6	3536 I6	3548 H6	3562 F6	2575 B10	2584 C4	2599 F14	2609 C12	2618 E13	3533 B16	2647 B16	2658 I12	2670 C7	3617 D6	3626 F3	3635 B6	3644 J7	3653 I4	3662 J7	3671 B6	3681 D6	3690 I9	3699 F14	3608 D12	3617 C13	3626 D13	3636 E16	3646 D16	3657 B16	3667 B16	3671 F16	3680 G16	4604 H9	4617 P17	5627 C3	6518 C3	7522 G4	7532 E12	7542 H16	9618 B3
34 F3	1502 J12	1536 D16	2513 D6	2622 E6	2531 D6	3540 I14	3549 A6	3563 B7	2576 H9	2591 C6	2601 D11	2610 F12	2619 B13	3534 E15	3648 D16	2661 D14	2671 C14	3602 J13	3618 E6	3627 G3	3636 H6	3645 A5	3654 I4	3663 B7	3672 H6	3682 F6	3691 B6	3600 P14	3609 C12	3618 P13	3627 B14	3637 B16	3647 B17	3658 B16	3672 F16	3681 P16	4608 B6	4618 P17	5628 D3	7511 D6	7523 A6	7533 C13	7543 G16	9632 C3
26 C2	1631 A1	1529 C2	2514 B6	2623 E4	2532 D6	3541 F5	3550 J6	2564 Q7	2577 C9	2592 G6	2602 E11	2611 C12	2620 E14	3636 B16	3649 C17	2662 H14	3602 J13	3619 I6	3628 G3	3637 B7	3646 A5	3655 I3	3664 J7	3673 B10	3683 C6	3692 H6	3601 D11	3610 E12	3619 D13	3628 E13	3638 D16	3648 D17	3660 B17	3673 F16	3682 H16	4610 J7	4619 C6	6511 A4	7512 C6	7534 I10	7534 E13	9611 J6
28 I2	1632 B2	1530 J14	2515 E6	2624 F4	2533 C7	3542 H4	3551 J4	3566 B6	2578 P9	2593 C6	2603 B12	2612 P12	2621 I16	3636 E6	3650 J6	2663 C6	3611 D4	3620 J6	3629 G6	3638 H5	3647 B6	3656 I3	3666 C6	3674 H10	3684 G6	3693 F14	3602 P10	3611 E11	3620 P13	3629 I16	3639 C16	3649 P17	3660 B17	3674 H16	3683 G17	4611 B7	4620 G6	6512 C4	7512 I6	7526 C4	7536 C16	9613 J12
27 E18	1633 A2	2501 J12	2516 P6	2625 E3	2534 H7	3543 G3	2552 I3	3566 G6	2579 C11	2594 I9	2604 D12	2613 D13	2622 C6	3637 B16	3651 F17	2664 G16	3612 D4	3621 E4	3630 H6	3639 J7	3648 B6	3657 J4	3666 C6	3675 B11	3686 A9	3694 P14	3603 B12	3612 D11	3621 B13	3631 B15	3640 D16	3650 P17	3661 B16	3675 G16	3684 H17	4612 G7	5611 P16	6513 J12	7513 H6	7526 J3	7536 D16	9614 J12
28 H17	1625 E2	2502 B3	2517 E6	2526 P3	2536 C6	3544 G3	2553 I4	2571 B6	2580 P11	2595 B6	2606 C12	2614 P13	2624 G6	3639 E16	2652 F17	2666 G16	3613 D6	3622 F4	3631 C7	3640 H6	3649 A4	3658 H13	3667 B6	3676 P11	3686 H9	3696 Q12	3604 D12	3613 C12	3622 D13	3632 E14	3641 P16	3651 P17	3662 C16	3676 H16	3685 H5	4613 Q16	6612 D3	6514 J12	7513 B9	7527 J3	7537 B16	9617 A6
29 H16	1626 F2	2503 D2	2518 D6	2527 E3	2536 I7	3545 G1	2564 D2	2572 H9	2581 C3	2596 H9	2606 E12	2615 C13	2625 P19	2639 P16	2658 C17	2666 G16	3614 P6	3623 E3	3632 H7	3641 C5	3650 H6	3660 H13	3669 I13	3676 E10	3687 A10	3696 Q12	3605 C12	3614 P12	3623 B13	3633 B15	3642 P16	3652 P17	3663 D16	3677 G16	4601 B6	4614 Q16	6613 E3	6515 G12	7515 B15	7528 G12	7538 B16	9618 A5
30 H19	1626 Q2	2504 E3	2519 D6	2528 F3	2537 B6	3546 A4	2560 Q12	2573 B10	2582 C4	2597 B6	2607 B13	2616 E13	2631 B14	2640 E16	2656 E16	2668 H17	3615 E5	3624 P3	3633 C6	3642 I5	3651 I4	3660 H13	3669 I13	3676 E10	3686 I10	3697 Q12	3606 E12	3615 D12	3634 E13	3634 E15	3643 I15	3656 B16	3666 E16	3676 G16	4602 H6	4615 I12	6625 B3	6516 E16	7515 E15	7529 H6	7539 B17	9619 I7



ITEMS MARKED * M *	FW-C50	FW-C55	FW-C70	FW-C72	FW-P73	FW-P78
2571/2572	330n	680n	1u	1u	100n	1u
2573/2574	470n	470n	680n	680n	470n	680n
2619/2620	2u2	2u2	0.47u	0.47u	2u2	0.47u
3593/3594	—	22K	68K	68K	—	68K
3649/3650	330R	330R	560R	33R	—	47R
3551/3552	10K	150K	10K	150K	150K	150K
3637/3638	10K	47K	10K	10K	10K	10K
3639/3640	22K	12K	22K	22K	22K	22K

* FOR SETS W/O BASSIC ALC
P 3561/2 FOR DPL SETS
C 3543/4 FOR NON-DPL SETS
\# PROVISION

▲ FOR NON-KARA SETS ONLY
□ FOR NON-KARA/NON-DPL & NO L.INE-OUT SETS
\+ SPECIFICALLY FOR FW540C/37
x SPECIFICALLY FOR 748P/37/72

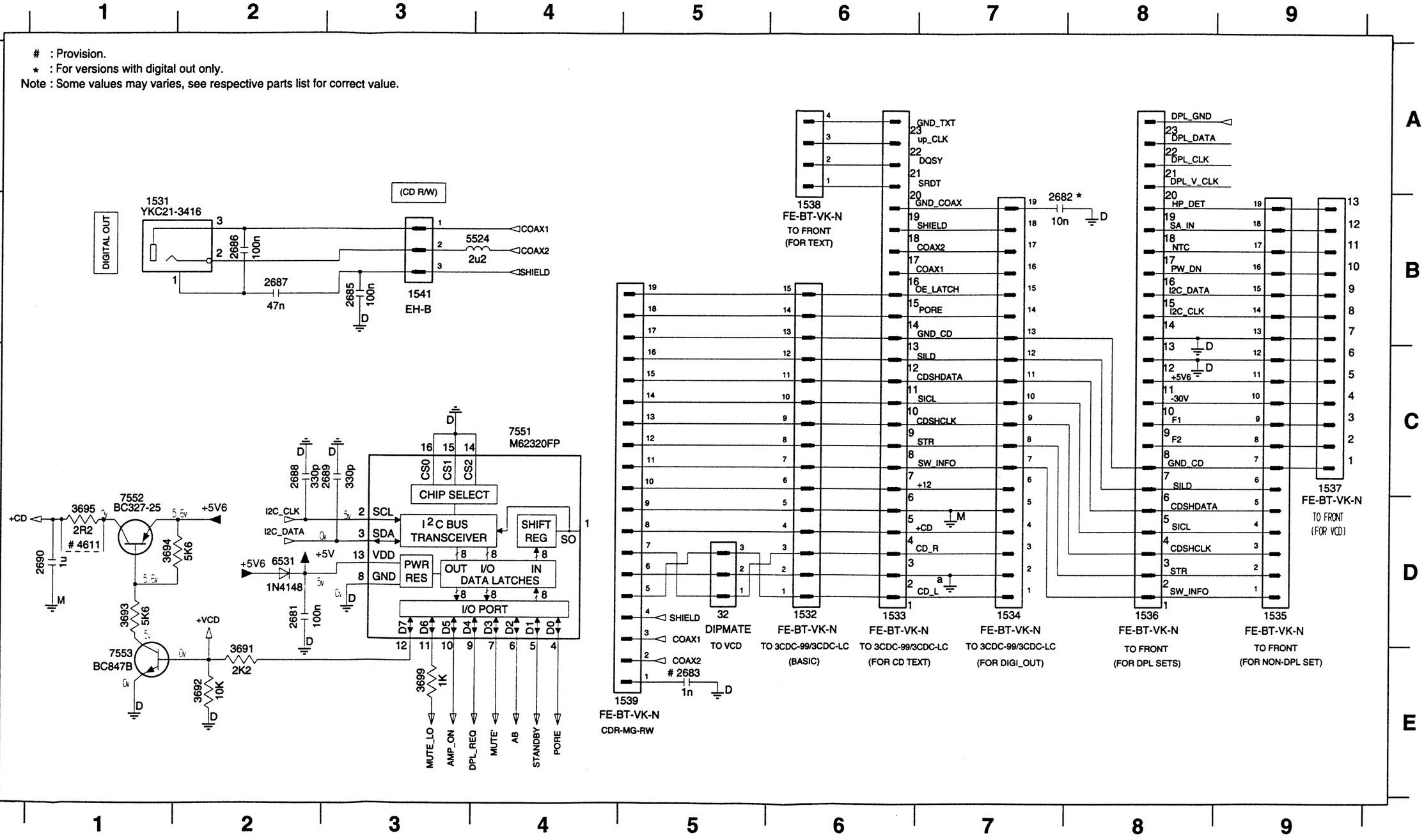
Note : Some values may varies, see respective parts list for correct value.

12-4

AF6 BOARD - CIRCUIT DIAGRAM (PART 2)

32 D5	1532 D6	1534 D7	1536 D8	1538 B6	1541 B3	2682 B7	2685 B3	2687 B2	2689 C3	3691 E2	3693 D1	3695 D1	4611 D1	6531 D2	7552 D1
1531 B1	1533 D6	1535 D9	1537 C9	1539 E5	2681 D2	2683 E5	2686 B2	2688 C2	2690 D1	3692 E2	3694 D1	3699 E3	5524 B4	7551 C4	7553 E1

: Provision.
* : For versions with digital out only.
Note : Some values may varies, see respective parts list for correct value.



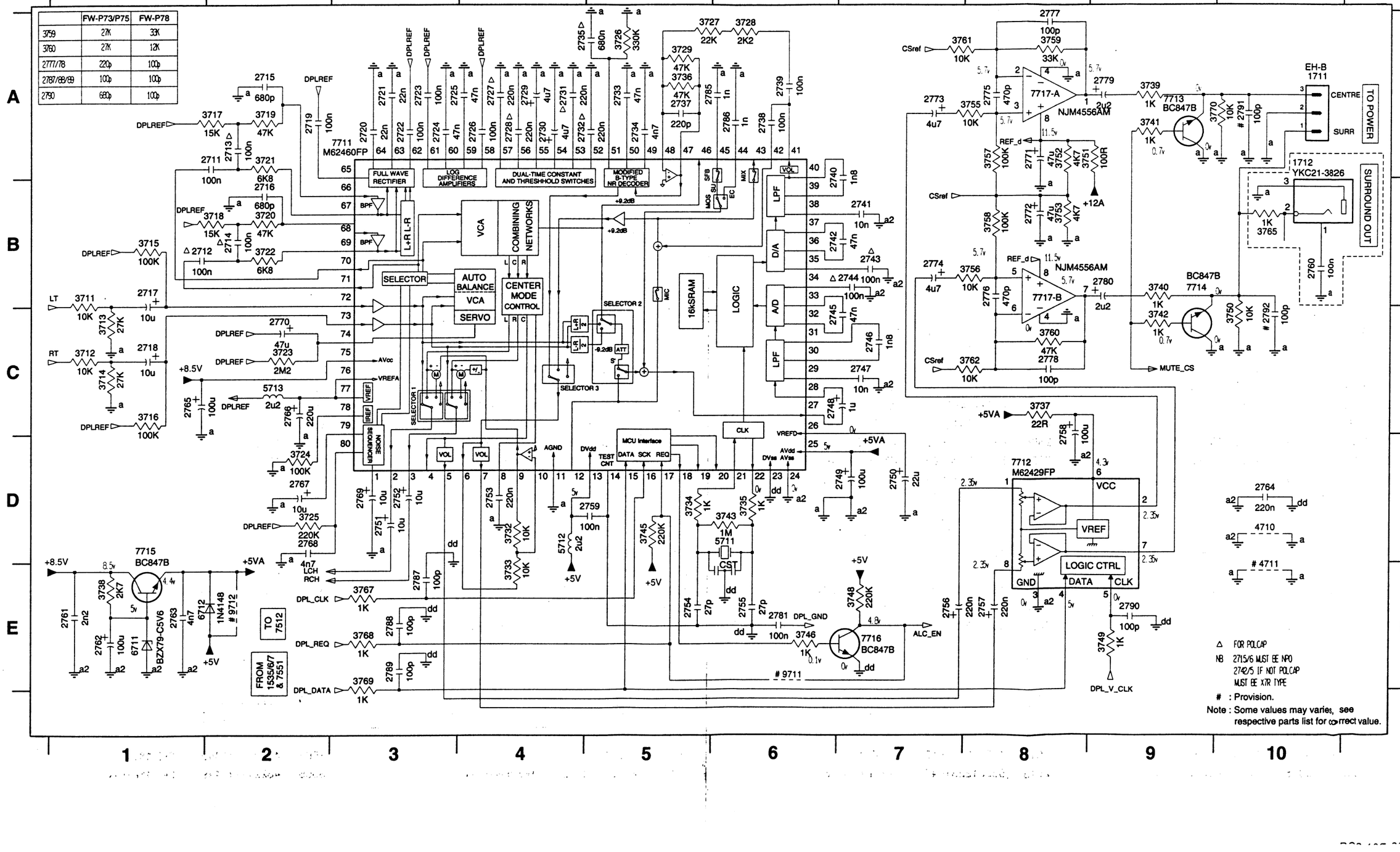
12-5

DOLBY PROLOGIC (DPL) - CIRCUIT DIAGRAM

1711 A10	2717 B1	2725 A3	2733 A5	2742 B6	2750 D7	2758 C8	2766 C2	2774 B7	2785 A5
1712 A10	2718 C1	2726 A4	2734 A5	2743 B7	2751 D3	2759 D5	2767 D2	2775 A8	2786 A6
2711 A2	2719 A2	2727 A4	2735 A4	2744 B7	2752 D3	2760 B10	2768 D2	2776 B8	2787 E3
2712 B1	2720 A3	2728 A4	2737 A5	2745 C6	2753 D4	2761 E1	2769 D3	2777 A8	2788 E3
2713 A2	2721 A3	2729 A4	2738 A6	2746 C7	2754 E5	2762 E1	2770 C2	2778 C8	2789 E3
2714 B2	2722 A3	2730 A4	2739 A6	2747 C7	2755 E6	2763 E1	2771 A8	2779 A9	2790 E9
2715 A2	2723 A3	2731 A4	2740 A6	2748 C6	2756 E7	2764 D10	2772 B8	2780 B9	2791 A10
2716 B2	2724 A3	2732 A4	2741 B7	2749 D7	2757 E8	2765 C1	2773 A7	2781 E6	2792 C10

3711 B1	3719 A2	3727 A5	3737 C8	3746 E6	3756 B8	3767 E3	5713 C2	7716 E7	
3712 C1	3720 B2	3728 A6	3738 E1	3748 E7	3757 A8	3768 E3	6711 E1	7717-A A8	
3713 C1	3721 A2	3729 A5	3739 A9	3749 E9	3758 B8	3769 E3	6712 E1	7717-B B8	
3714 C1	3722 B2	3732 D4	3740 B9	3750 C10	3759 A8	3770 A9	7711 A3	9711 E6	
3715 B1	3723 C2	3733 E4	3741 A9	3751 A8	3760 C8	4710 D10	7712 D8	9712 E2	
3716 C1	3724 D2	3734 D5	3742 C9	3752 A8	3761 A7	4711 E10	7713 A9		
3717 A2	3725 D2	3735 D6	3743 D6	3753 B8	3762 C8	5711 D6	7714 B9		
3718 B2	3726 A5	3736 A5	3745 D5	3755 A8	3765 B10	5712 D4	7715 D1		

	FW-P73/P75	FW-P78
3759	27K	33K
3760	27K	12K
2777/78	220p	100p
2787/88/89	100p	100p
2790	680p	100p



ELECTRICAL PARTS LIST - AF6 BOARD

MISCELLANEOUS

1523	482226710953	Flex Connector 7P
1525	482226720452	Cinch socket - Aux in
1526	482226720452	Cinch socket - Line-out
1527	482226731729	Cinch socket - Sub-Woofer out
1528	482226710731	Flex Connector 6P
1531	482226731729	Cinch socket - Digital out
1534	482226511553	Flex Connector 19P
1535	482226511553	Flex Connector 19P
1542	482226710731	Flex Connector 6P
1543	482226511529	Headphone Socket

CAPACITORS

2501	482212614585	100nF 10% 50V
2502	482212613838	100nF +80/-20% 50V
2504	482212613838	100nF +80/-20% 50V
2511	482212440769	4,7µF 20% 100V
2512	482212440769	4,7µF 20% 100V
2513	482212440769	4,7µF 20% 100V
2514	482212440769	4,7µF 20% 100V
2515	532212232531	100pF 5% 50V
2516	532212232531	100pF 5% 50V
2517	482212614585	100nF 10% 50V
2518	482212440433	47µF 20% 25V
2519	532212232531	100pF 5% 50V
2520	532212232531	100pF 5% 50V
2521	482212440769	4,7µF 20% 100V
2522	482212440769	4,7µF 20% 100V
2523	532212232658	22pF 5% 50V
2524	532212232658	22pF 5% 50V
2525	482212421913	1µF 20% 63V
2526	482212421913	1µF 20% 63V
2527	532212234099	470pF 10% 63V
2528	532212234099	470pF 10% 63V
2529	482212613838	100nF +80/-20% 50V
2530	482212614585	100nF 10% 50V
2531	532212232654	22nF 10% 63V
2532	482212440433	47µF 20% 25V
2533	482212440769	4,7µF 20% 100V
2534	482212440769	4,7µF 20% 100V
2535	482212232535	680pF 10% 63V
2536	482212232535	680pF 10% 63V
2537	482212613692	47pF 1% 63V
2538	482212613692	47pF 1% 63V
2539	532212232654	22nF 10% 63V
2540	482212440433	47µF 20% 25V
2541	482212421913	1µF 20% 63V
2542	482212421913	1µF 20% 63V
2543	482212233127	2,2nF 10% 63V
2544	482212233127	2,2nF 10% 63V
2545	482212613838	100nF +80/-20% 50V
2546	482212441751	47µF 20% 50V
2547	532212232448	10pF 5% 63V
2548	532212232448	10pF 5% 63V
2549	482212440769	4,7µF 20% 100V
2550	482212440769	4,7µF 20% 100V
2551	482212614585	100nF 10% 50V
2552	482212441751	47µF 20% 50V
2553	482212613486	15pF 2% 63V
2554	482212613838	100nF +80/-20% 50V
2560	482212441407	0,47µF 20% 63V
2561	482212441407	0,47µF 20% 63V
2562	482212441407	0,47µF 20% 63V
2563	482212142408	220nF 5% 63V
2564	482212142408	220nF 5% 63V
2565	482212610525	8,2nF 10% 63V
2566	482212610525	8,2nF 10% 63V
2571	532212142498	680nF 5% 63V
2572	532212142498	680nF 5% 63V
2573	482212151252	470nF 5% 63V
2574	482212151252	470nF 5% 63V
2575	482212151252	470nF 5% 63V
2576	482212151252	470nF 5% 63V
2577	532212231866	6,8nF 10% 63V
2578	532212231866	6,8nF 10% 63V
2579	532212231647	1nF 10% 63V
2580	532212231647	1nF 10% 63V
2581	482212233127	2,2nF 10% 63V
2582	482212440207	100µF 20% 25V
2583	482212440207	100µF 20% 25V
2584	532212232654	22nF 10% 63V
2591	482212480144	220µF 20% 25V
2592	482212480144	220µF 20% 25V
2593	482212440433	47µF 20% 25V
2594	482212440433	47µF 20% 25V
2595	532212234099	470pF 10% 63V
2596	532212234099	470pF 10% 63V
2597	482212233575	220pF 5% 63V
2598	482212233575	220pF 5% 63V
2599	482212441751	47µF 20% 50V
2601	482212612105	33nF 5% 50V
2602	482212612105	33nF 5% 50V
2603	482212233891	3,3nF 10% 63V
2604	482212233891	3,3nF 10% 63V
2605	532212234099	470pF 10% 63V
2606	532212234099	470pF 10% 63V
2607	482212614585	100nF 10% 50V
2608	482212614585	100nF 10% 50V
2609	482212151252	470nF 5% 63V
2610	482212151252	470nF 5% 63V
2611	482212610847	1,8nF 10% 63V
2612	482212610847	1,8nF 10% 63V
2613	532212231647	1nF 10% 63V
2614	532212231647	1nF 10% 63V
2615	482212233575	220pF 5% 63V
2616	482212233575	220pF 5% 63V
2617	532212234099	470pF 10% 63V
2618	532212234099	470pF 10% 63V
2619	482212422652	2,2µF 20% 50V
2620	482212422652	2,2µF 20% 50V
2621	482212440207	100µF 20% 25V
2623	482212613482	470nF +80/-20% 16V
2624	482212613482	470nF +80/-20% 16V
2625	482212613838	100nF +80/-20% 50V
2631	482212421913	1µF 20% 63V
2632	482212421913	1µF 20% 63V
2633	532212234099	470pF 10% 63V
2634	532212234099	470pF 10% 63V
2635	532212232531	100pF 5% 50V
2636	532212232531	100pF 5% 50V
2637	482212613692	47pF 1% 63V
2638	482212613692	47pF 1% 63V
2639	532212232654	22nF 10% 63V
2640	482212440433	47µF 20% 25V
2641	482212440207	100µF 20% 25V
2647	482212481151	22µF 50V
2648	482212481151	22µF 50V
2649	532212232531	100pF 5% 50V
2650	532212232531	100pF 5% 50V
2655	482212440769	4,7µF 20% 100V
2658	482212233575	220pF 5% 63V
2661	482212421913	1µF 20% 63V
2662	532212231647	1nF 10% 63V
2663	532212232448	10pF 5% 63V
2664	482212421913	1µF 20% 63V
2666	482212440207	100µF 20% 25V
2668	532212234099	470pF 10% 63V
2669	482212613838	100nF +80/-20% 50V
2670	532212232658	22pF 5% 50V
2681	482212614585	100nF 10% 50V
2682	532212234098	10nF 10% 63V
2685	482212613838	100nF +80/-20% 50V
2686	482212613838	100nF +80/-20% 50V
2687	482212613751	47nF 10% 63V
2688	532212231863	330pF 5% 63V
2689	532212231863	330pF 5% 63V
2690	482212614043	1µF +80/-20% 16V
2691	532212232654	22nF 10% 63V
2692	532212232654	22nF 10% 63V
2694	482212613838	100nF +80/-20% 50V

RESISTORS

3501	482205110102	1k 2% 0,25W
3502	482211710833	10k 1% 0,1W
3511	482205120182	1k8 5% 0,1W
3512	482205120182	1k8 5% 0,1W
3513	482211683961	6k8 5%
3514	482211711507	6k8 1% 0,1W
3515	482211711507	6k8 1% 0,1W
3516	482211711507	6k8 1% 0,1W
3517	482205120332	3k3 5% 0,1W
3518	482205120332	3k3 5% 0,1W
3519	482205120333	33k 5% 0,1W
3520	482205120333	33k 5% 0,1W
3521	482211683874	220k 5% 0,5W
3522	482211683874	220k 5% 0,5W
3523	482211711149	82k 1% 0,1W
3524	482211711149	82k 1% 0,1W
3525	482205110102	1k 2% 0,25W
3526	482205110102	1k 2% 0,25W
3527	482205110102	1k 2% 0,25W
3528	482205110102	1k 2% 0,25W
3529	482211711449	2k2 1% 0,1W
3530	482211652256	2k2 5% 0,5W
3531	482211652256	2k2 5% 0,5W
3532	482211652256	2k2 5% 0,5W
3533	482211652234	100k 5% 0,5W
3534	482211652234	100k 5% 0,5W
3535	482211710837	100k 1% 0,1W
3536	482211710837	100k 1% 0,1W
3537	482205120333	33k 5% 0,1W
3538	482205120333	33k 5% 0,1W
3540	482211710833	10k 1% 0,1W
3541	482205110102	1k 2% 0,25W
3542	482205110102	1k 2% 0,25W
3543	482211711507	6k8 1% 0,1W
3544	482211711507	6k8 1% 0,1W
3545	482205120273	27k 5% 0,1W
3546	482211652264	27k 5% 0,5W
3547	482205120182	1k8 5% 0,1W
3548	482205120182	1k8 5% 0,1W
3549	482205120562	5k6 5% 0,1W
3550	482211710834	47k 1% 0,1W
3551	482205120154	150k 5% 0,1W
3552	482205120154	150k 5% 0,1W
3553	482205120334	330k 5% 0,1W
3554	482211710353	150R 1% 0,1W
3555	482205120391	390R 5% 0,1W
3556	482211711449	2k2 1% 0,1W
3557	482211711149	82k 1% 0,1W
3558	482205120225	2M2 5% 0,1W
3559	482205120225	2M2 5% 0,1W
3560	482205120475	4M7 5% 0,1W
3563	482211711449	2k2 1% 0,1W
3564	482211711449	2k2 1% 0,1W
3565	482211711449	2k2 1% 0,1W
3566	482211711449	2k2 1% 0,1W
3567	482205120223	22k 5% 0,1W
3568	482205120223	22k 5% 0,1W

ELECTRICAL PARTS LIST - AF6 BOARD

RESISTORS

3569	482205120472	4k7 5% 0,1W
3570	482205120472	4k7 5% 0,1W
3571	482205120472	4k7 5% 0,1W
3572	482205120472	4k7 5% 0,1W
3573	482205120472	4k7 5% 0,1W
3574	482205120472	4k7 5% 0,1W
3575	482211711503	220R 1% 0,1W
3576	482211711503	220R 1% 0,1W
3577	482205011002	1k 1% 0,4W
3578	482205011002	1k 1% 0,4W
3580	482205110102	1k 2% 0,25W
3581	482211711449	2k2 1% 0,1W
3582	482211652256	2k2 5% 0,5W
3583	482211711503	220R 1% 0,1W
3584	482211711503	220R 1% 0,1W
3585	482211710834	47k 1% 0,1W
3586	482211710834	47k 1% 0,1W
3587	482205120154	150k 5% 0,1W
3588	482205120154	150k 5% 0,1W
3589	482211711449	2k2 1% 0,1W
3590	482211711449	2k2 1% 0,1W
3591	482205120223	22k 5% 0,1W
3592	482205120223	22k 5% 0,1W
3593	482211652257	22k 5% 0,5W
3593	482211683884	47k 5% 0,5W /37
3594	482211652257	22k 5% 0,5W
3594	482211710834	47k 1% 0,1W /37
3595	482205120333	33k 5% 0,1W
3596	482211710834	47k 1% 0,1W
3597	482205120105	1M 5% 0,1W
3598	482205120475	4M7 5% 0,1W
3599	482211711148	56k 1% 0,1W
3600	482211711148	56k 1% 0,1W
3601	482205120332	3k3 5% 0,1W
3602	482205120332	3k3 5% 0,1W
3603	482205120684	680k 5% 0,1W
3604	482205120684	680k 5% 0,1W
3605	482211713579	220k 1% 0,1W
3606	482211713579	220k 1% 0,1W
3607	482205021003	10k 1% 0,6W
3608	482205021003	10k 1% 0,6W
3609	482211710833	10k 1% 0,1W
3610	482211710833	10k 1% 0,1W
3611	482205120562	5k6 5% 0,1W
3612	482205120562	5k6 5% 0,1W
3613	482205120562	5k6 5% 0,1W
3614	482205120562	5k6 5% 0,1W
3615	482205120562	5k6 5% 0,1W
3616	482205120562	5k6 5% 0,1W
3617	482205120822	8k2 5% 0,1W
3618	482205120822	8k2 5% 0,1W
3619	482205120822	8k2 5% 0,1W
3620	482205120822	8k2 5% 0,1W
3621	482205120822	8k2 5% 0,1W
3622	482205120822	8k2 5% 0,1W
3623	482211710834	47k 1% 0,1W
3624	482211710834	47k 1% 0,1W
3625	482205110102	1k 2% 0,25W
3626	482205110102	1k 2% 0,25W
3627	482211711503	220R 1% 0,1W
3628	482211711503	220R 1% 0,1W
3629	482211711454	820R 1% 0,1W
3631	482211652231	820R 5% 0,5W
3632	482211652231	820R 5% 0,5W
3633	482205120562	5k6 5% 0,1W
3634	482205120562	5k6 5% 0,1W
3635	482211710833	10k 1% 0,1W
3636	482211710833	10k 1% 0,1W
3637	482211710834	47k 1% 0,1W
3638	482211710834	47k 1% 0,1W
3639	482211711383	12k 1% 0,1W
3640	482211711383	12k 1% 0,1W
3641	482205210109	⚠ 10R 5% 0,33W
3642	482205120472	4k7 5% 0,1W
3643	482205120472	4k7 5% 0,1W
3645	482205120479	47R 5% 0,1W
3646	482205120479	47R 5% 0,1W
3647	482205120479	47R 5% 0,1W
3648	482205120479	47R 5% 0,1W
3649	482211713577	330R 1% 1,25W
3650	482211713577	330R 1% 1,25W
3651	482205120392	3k9 5% 0,1W
3652	482205120392	3k9 5% 0,1W
3655	482205021003	10k 1% 0,6W
3656	482211710833	10k 1% 0,1W
3657	482205110102	1k 2% 0,25W
3658	482205120562	5k6 5% 0,1W
3660	482205120472	4k7 5% 0,1W
3661	482205120475	4M7 5% 0,1W
3662	482205110102	1k 2% 0,25W
3663	482205110102	1k 2% 0,25W
3671	482211713579	220k 1% 0,1W
3672	482211713579	220k 1% 0,1W
3673	482211712955	2k7 1% 0,1W
3674	482205120334	330k 5% 0,1W
3675	482211711449	2k2 1% 0,1W
3676	482205120229	22R 5% 0,1W
3677	482205120471	470R 5% 0,1W
3681	482205210229	⚠ 22R 5% 0,33W
3682	482205110102	1k 2% 0,25W
3683	482205120471	470R 5% 0,1W
3684	482205120392	3k9 5% 0,1W
3691	482211711449	2k2 1% 0,1W
3692	482211710833	10k 1% 0,1W

ELECTRICAL PARTS LIST - AF6 BOARD

3693	482205120562	5k6 5% 0,1W
3694	482205120562	5k6 5% 0,1W
3695	482205120228	2R2 5% 0,1W
3699	482205011002	1k 1% 0,4W
3768	482205011002	1k 1% 0,4W
4505	482205120008	0R Jumper 0805
4506	482205120008	0R Jumper 0805
4513	482205120008	0R Jumper 0805
4514	482205120008	0R Jumper 0805
4515	482205120008	0R Jumper 0805
4516	482205120008	0R Jumper 0805
4522	482205120008	0R Jumper 0805
4523	482205120008	0R Jumper 0805
4524	482205120008	0R Jumper 0805
4525	482205120008	0R Jumper 0805
4527	482205120008	0R Jumper 0805
4528	482205120008	0R Jumper 0805
4529	482205120008	0R Jumper 0805
4530	482205120008	0R Jumper 0805
4531	482205120008	0R Jumper 0805
4532	482205120008	0R Jumper 0805
4533	482205120008	0R Jumper 0805
4534	482205120008	0R Jumper 0805
4535	482205120008	0R Jumper 0805
4536	482205120008	0R Jumper 0805
4537	482205120008	0R Jumper 0805
4538	482205120008	0R Jumper 0805
4539	482205120008	0R Jumper 0805
4540	482205120008	0R Jumper 0805
4541	482205120008	0R Jumper 0805
4542	482205120008	0R Jumper 0805
4543	482205120008	0R Jumper 0805
4544	482205120008	0R Jumper 0805
4545	482205120008	0R Jumper 0805
4546	482205120008	0R Jumper 0805
4547	482205120008	0R Jumper 0805
4548	482205120008	0R Jumper 0805
4549	482205120008	0R Jumper 0805
4551	482205120008	0R Jumper 0805
4553	482205120008	0R Jumper 0805
4554	482205120008	0R Jumper 0805
4556	482205120008	0R Jumper 0805
4557	482205120008	0R Jumper 0805
4558	482205120008	0R Jumper 0805
4559	482205120008	0R Jumper 0805
4561	482205120008	0R Jumper 0805
4562	482205120008	0R Jumper 0805
4563	482205120008	0R Jumper 0805
4565	482205120008	0R Jumper 0805
4566	482205120008	0R Jumper 0805
4567	482205120008	0R Jumper 0805
4571	482205120008	0R Jumper 0805
4573	482205120008	0R Jumper 0805
4580	482205120008	0R Jumper 0805
4712	482205120008	0R Jumper 0805
4713	482205120008	0R Jumper 0805
4714	482205120008	0R Jumper 0805
4715	482205120008	0R Jumper 0805
4716	482205120008	0R Jumper 0805

COILS & FILTERS

5511	482215762552	Coil 2,2µH 5%
5512	482215710586	Coil 2,2µH 10%
5513	482215710586	Coil 2,2µH 10%
5523	482215762552	Coil 2,2µH 5%
5524	482215710586	Coil 2,2µH 10%
5525	482215710586	Coil 2,2µH 10%
5526	482215762552	Coil 2,2µH 5%
5527	482215710586	Coil 2,2µH 10%
5528	482215710586	Coil 2,2µH 10%
5531	482215762552	Coil 2,2µH 5%
5532	482215762552	Coil 2,2µH 5%

DIODES

6511	933887190673	BZX55-F9V1
6512	933887190673	BZX55-F9V1
6513	482213031878	1N4003G
6515	482213030621	1N4148
6516	482213030621	1N4148
6531	482213030621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7511	482220933652	TEA6321T/V1
7512	482220983357	NJM4560M
7513	482220983357	NJM4560M
7515	482220931378	NJM4556AM
7521	482213060511	BC847B
7522	482213060511	BC847B
7523	482213060511	BC847B
7524	482213060511	BC847B
7525	482213040959	BC547B
7526	482213060373	BC857B
7527	482213060511	BC847B
7528	482213060511	BC847B
7529	482213060373	BC857B
7531	482213060511	BC847B
7532	482213060511	BC847B
7533	482213060511	BC847B
7534	482213060511	BC847B
7535	482213042804	BC817-25
7536	482213042804	BC817-25
7537	482213060511	BC847B
7538	482213060511	BC847B
7539	482213060373	BC857B

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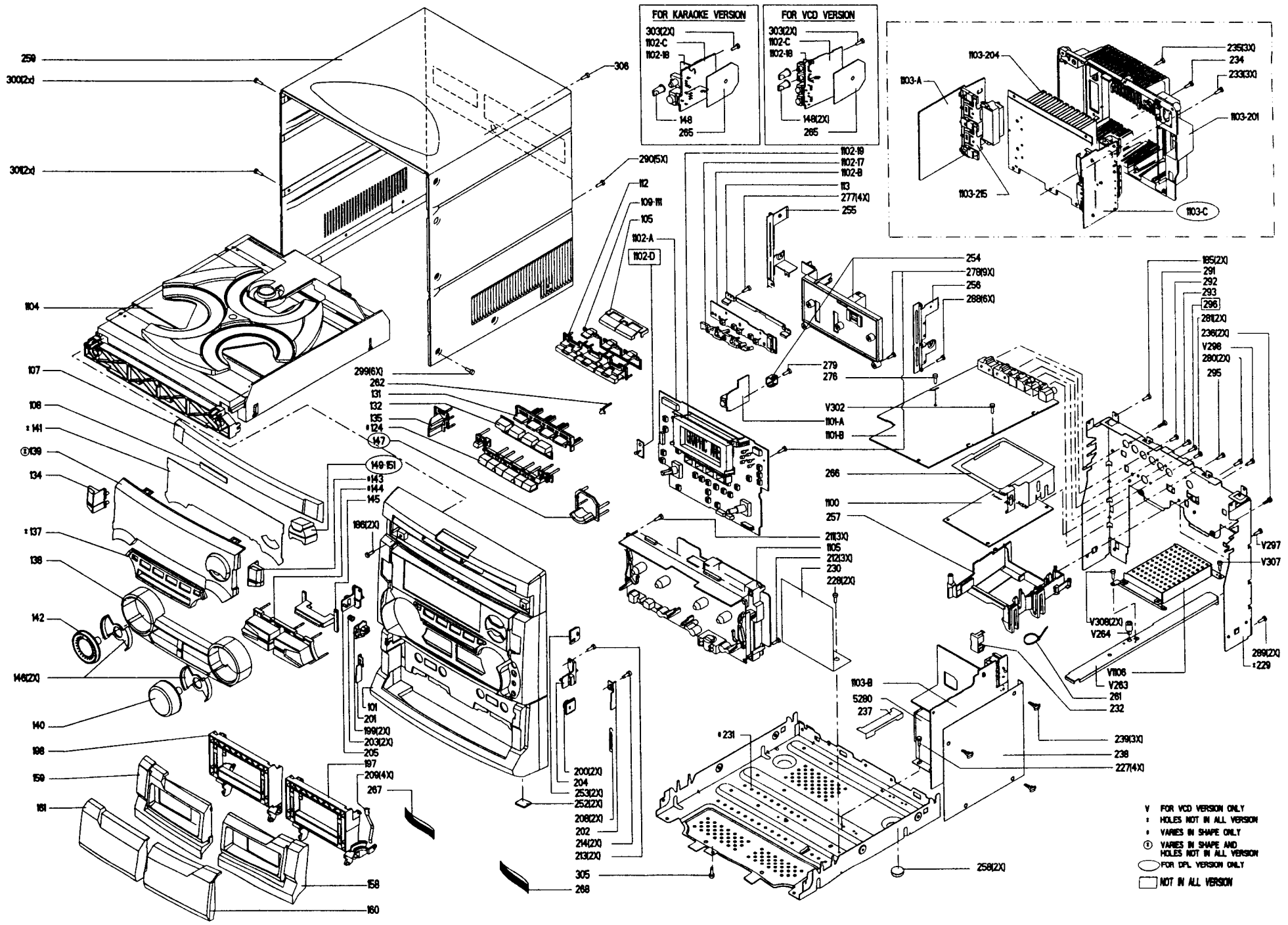
ELECTRICAL PARTS LIST - AF6 BOARD

TRANSISTORS & INTEGRATED CIRCUITS

7541	482213060511	BC847B
7543	482213042804	BC817-25
7551	482220917345	M62320FP
7552	482213041246	BC327-25
7553	482213060511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.


FOR KARAOKE VERSION
303(2X)
1102-C
1102-18
148
265
FOR VCD VERSION
303(2X)
1102-C
1102-18
148(2X)
265
1103-A
1103-204
1103-215
235(3X)
234
233(3X)
1103-201
1103-C
259
300(2X)
301(2X)
308
1104
107
108
141
139
134
137
138
142
146(2X)
140
198
159
161
158
160
290(5X)
112
109-111
105
1102-A
1102-D
1102-19
1102-17
1102-8
113
277(4X)
255
254
278(9X)
256
288(6X)
279
278
V302
1101-A
1101-B
299(6X)
262
131
132
135
124
147
149-151
143
144
145
198(2X)
101
201
199(2X)
203(2X)
205
197
209(4X)
267
200(2X)
204
253(2X)
252(2X)
208(2X)
202
214(2X)
213(2X)
305
268
211(3X)
1105
212(3X)
230
228(2X)
266
1100
257
185(2X)
291
292
293
296
281(2X)
236(2X)
V298
280(2X)
295
V297
V307
V308(2X)
V264
289(2X)
229
V1106
V263
261
232
1103-B
5280
237
231
239(3X)
238
227(4X)
258(2X)
V FOR VCD VERSION ONLY
HOLES NOT IN ALL VERSION
VARIES IN SHAPE ONLY
VARIES IN SHAPE AND HOLES NOT IN ALL VERSION
FOR DPL VERSION ONLY
NOT IN ALL VERSION

PCS 103 441

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

0101	313911810910	Cabinet Front
0101	313911789940	Cabinet Front /37
0105	313911789750	Button CDC Open/Close
0107	313911789760	Cover Tray CDC
0108	482245413408	Badge Philips
0112	313911789770	Button Set CDC Select
0113	313911469190	Bracket Disc Stopper
0124	313911789970	Button Set Control
0131	482246410514	Frame Lightguide Source Sel
0132	313911789920	Button Set Source
0134	313911789800	Button Standby/Timer
0135	313911810150	Button Set Dub/Rec
0137	313911810960	Cover Orn Control
0138	313911810140	Cover Orn SNP
0139	313911811590	Window Display /21/21M/30
0139	313911810810	Window Display /22
0139	313911811000	Window Display /37
0140	313911789830	Knob Volume Rotary
0142	313911810130	Jog Rotary
0143	482246693014	Cover RDS/NEWS
0143	313911810900	Button Set RDS/NEWS /22
0144	313911810870	Button Set SNP
0148	313911810860	Knob Karaoke /21/21M/22/30
0158	313911810880	Cover Cassette Right
0159	313911810890	Cover Cassette Left
0160	313911810820	Lens Cassette Right
0161	313911810830	Lens Cassette Left
0197	482244310488	Door Cassette Right
0198	482244310487	Door Cassette Left
0199	482240210621	Push-Catch
0200	482252910322	Damper Assembly
0203	482249211344	Spring Compression
0204	482240211246	Bracket Right
0205	482240211245	Bracket Left
0208	482249211345	Spring Tension
0209	482249242787	Spring Cassette
0232	482240210288	Bracket Mains Socket
0239	482246693148	Spacer 5mm
0252	482246240683	Foot Rubber (SQ)
0254	482246612197	Plate Front
0258	482246240683	Plate (Foot)
0259	313911469230	Cabinet Rear
0350	313911877430	L/R Loudspeaker Box
0351	482230350063	FM Aerial
0351	482232011094	FM Aerial /37
0352	313911877320	Surround Speaker /21/21M/30
0356	313922884240	Remote Control
0384	482230350082	AM Frame Aerial
0385	482232110249	⚠ Mains Cord /21/21M/22
0385	482232110954	⚠ Mains Cord /30
0385	482232111466	⚠ Mains Cord /37
0386	482226321092	⚠ Adaptor Plug 6A 250V /21
0387	313911619750	Instruction For Use /21/21M/30
0387	313911619550	Instruction For Use /22
0387	313911619520	Instruction For Use /37
1571	482232012702	FFC Foil 06P/140/06P BD
1573	482232012654	FFC Foil 07P/220/07P AD
1575	313911034390	FFC Foil 19P/340/19P BD
1653	482232012703	FFC Foil 07P/140/07P BD
1680	482232012656	FFC AD 09P 280mm Folded
1681	482232012704	FFC Foil 19P/480/19P BD
5280	482214610755	⚠ Mains Transformer /21/21M
5280	482214610728	⚠ Mains Transformer /22/30
5280	482214611129	⚠ Mains Transformer /37

Note : Only the parts mentioned in this list are normal service spare parts.

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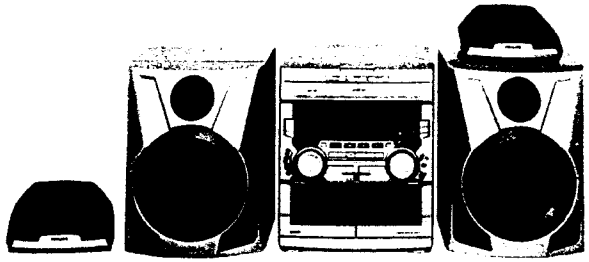
SCREW LISTS - MAIN UNIT

185	D3 x 10
186	D3 x 25
211	D3 x 12
212	D3 x 12
213	D3 x 12
214	D3 x 12
227	M3 x 6
228	M3 x 6
233	M3 x 10
234	D3 x 12
235	M3 x 10
236	M3 x 10
276	D3 x 12
277	D3 x 12
278	D3 x 12
279	M3 x 12
280	D3 x 12
281	D3 x 12
288	D3 x 10
289	M3 x 10
290	M3 x 10
291	D3 x 12
292	D3 x 12
293	D3 x 12
295	D3 x 12
299	M3 x 10
300	M3 x 10
301	M3 x 10
303	D3 x 12
305	M3 x 6
306	M3 x 10

Service
Service
Service



Service Manual

COMPACT disc DIGITAL AUDIO

Introduction of FW-C55/34 & FW-C58/34

For Service documentation please refer to Service Manual FW-C55/22 - 3139 785 22170.

FW-C55/34 & FW-C58/34 refers to FW-C55/22 with the following adaptations:

1. Mechanical & Accessories

Add	0352	313911877320	Surround Speaker
Change	0139	313911810850	Window Display (For FW-C58/34 only)
Change	0143	313911810840	Button Set RDS/NEWS/DB
	0159	313911811290	Cover Cassette Left
	0387	313911619540	Instruction For Use

2. Front Board

Add	1440	482227613775	Tact Switch
	6478	482213030621	1N4148
Change	3404	482205120471	470R 5% 0,1W
	3577	482205120471	470R 5% 0,1W
Delete	2506 , 2507 , 3660 , 3661		

3. Tuner Board : Refer to ECO5 SYS /14RDS version 2-Band, FM/MW (RDS).

4. Tape Module : Refer to attach pages (9-1 to 9-14) ETF7 DB/DD/FR Module.

5. Power 4-99 Module

Add	1304	482226510912	Matrix Surround Terminal
Change	201	482242610608	Rucksack With Matrix Surr. (For FW-C58/34 only)

CLASS 1
LASER PRODUCT

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GB 3139 785 22190

PCS 103 168

PHILIPS

ETF7 TAPE MODULE

(Dolby Version)

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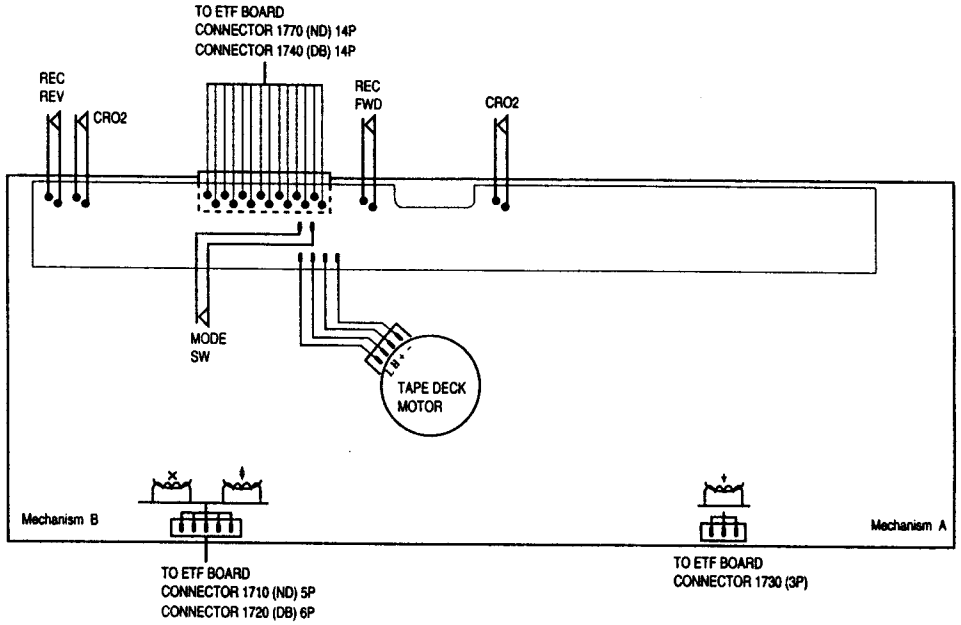
Servo Circuit diagram 9-8
Dolby Circuit diagram 9-9
Exploded views & parts list 9-10
Electrical parts list 9-13

9-1

Tapedeck wiring (Double deck)



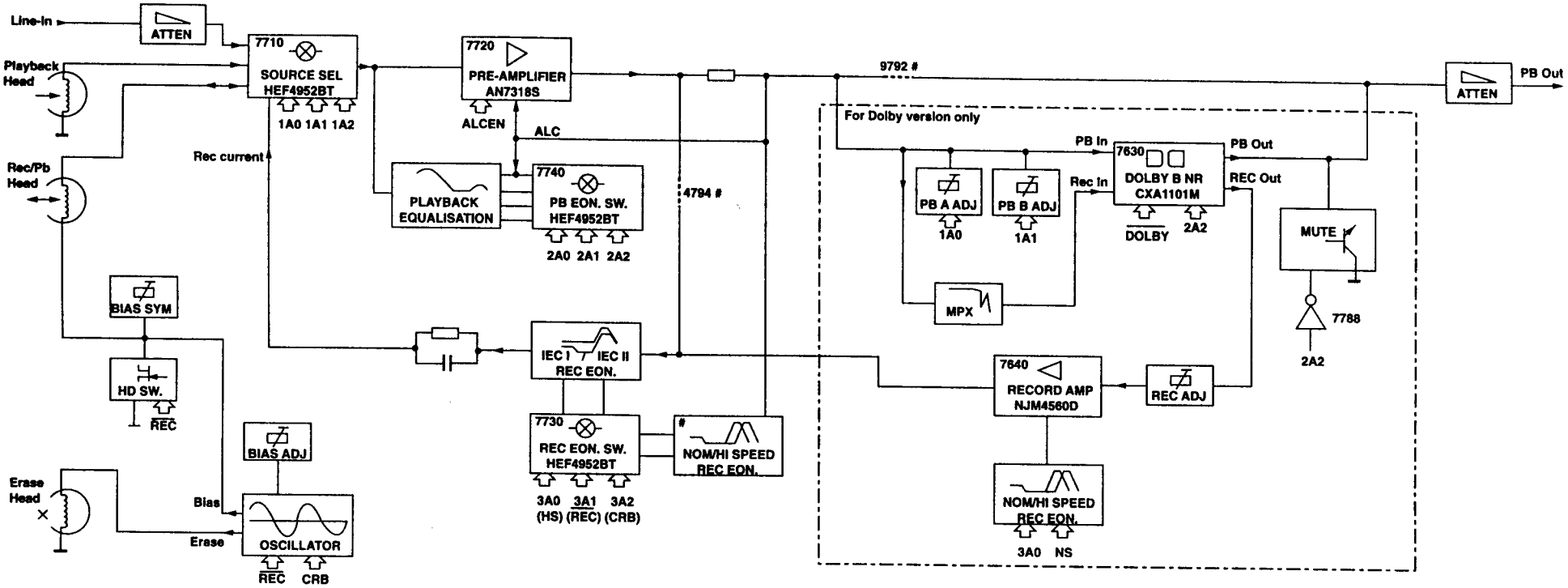
OPTIONS / VARIANTS TABLE

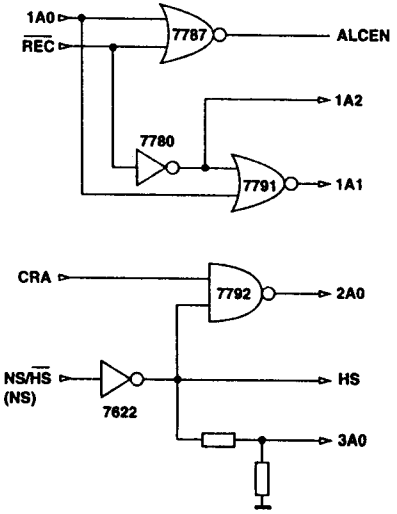
MODULE	ETF7		
VARIANT	1	2	3
FEATURES	DB/DD/FR	ND/DD/FR	ND/DD/FF
Deck configuration	double	double	double
Deck type (Tokyo Pigeon)	CWE	CWE	CWE
Autoreverse	yes (B)	yes (B)	no
Auto Replay	no	no	yes (A+B)
Motor configuration	single	single	single
Auto tape type selection	yes	yes	yes
Dolby type B Noise Reduction	yes	no	no
19 kHz pilot suppression	yes	no	no
Normal / High speed dubbing	yes	yes	no
Cue/Review & Fwd/Rewind	yes	yes	yes

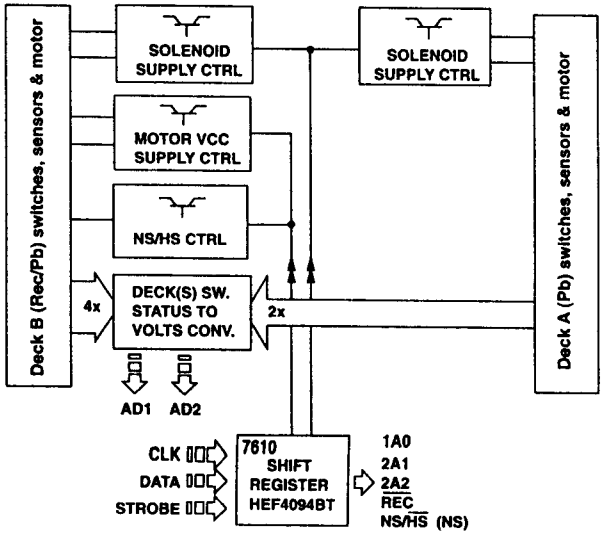
DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

9-2

BLOCK DIAGRAM







NOTE: # For Non-dolby version only
Only 1 channel is presented.

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby version only)
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby B NR version only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

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13. Motor Speed (For FR versions only)
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR version only)

15. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non-Autoreverse
FR	Autoreverse Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

1	REC-L	Record input left
2	REC-R	Record input right
3	GND A	AF Ground
4	TAPE-L	Playback output left
5	+12V	D.C. supply (+12V) for AF electronics
6	TAPE-R	Playback output right
7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

1	GND M	Motor Ground
2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

1	AD2	Deck sensing switches output voltage / Deck A EOT
2	AD1	Deck sensing switches output voltage / Deck B EOT
3	+5V	DC supply +5V for ADC network
4	GND P	Control & Oscillator Ground
5	CLK	HEF4094BT shift register Clock line
6	DATA	HEF4094BT shift register Data line
7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON ***(For Non-Dolby version only)***

1	B R/P HD L+	R/P Head left channel positive
2	GND A	R/P Head return ground
3	B R/P HD R+	R/P Head right channel positive
4	ERASE HEAD	Erase Head
5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON ***(For Dolby B NR version only)***

1	B R/P HD L+	R/P Head left channel positive
2	B R/P HD L-	R/P Head left channel negative
3	B R/P HD R+	R/P Head right channel positive
4	B R/P HD R-	R/P Head right channel negative
5	ERASE HEAD	Erase Head
6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***

1	A PB HD L+	Pb Head left channel positive
2	GND A	Pb Head return ground shield
3	A PB HD R+	Pb Head right channel positive

9-4

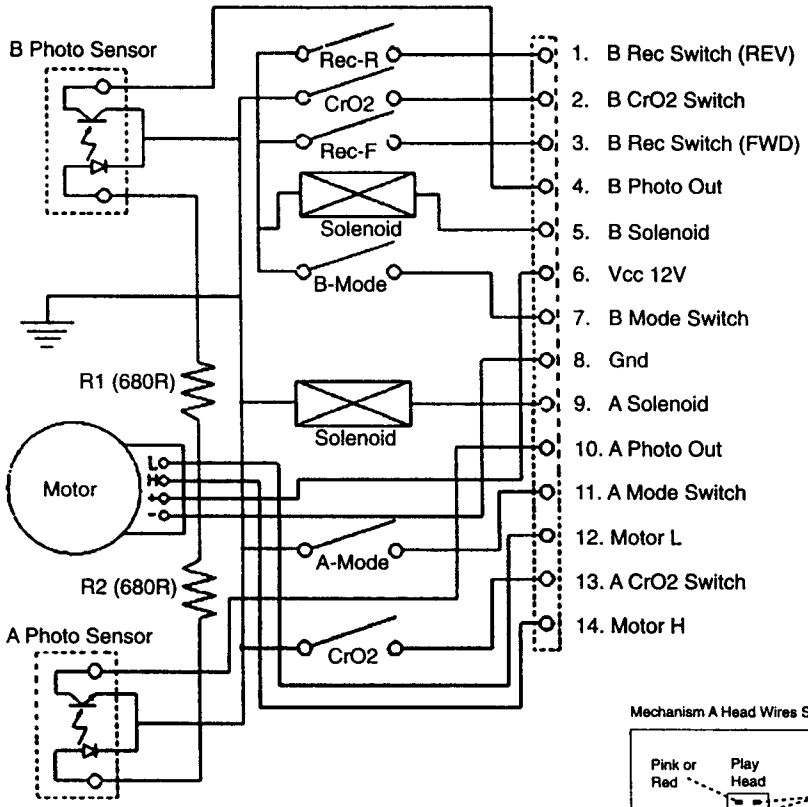
CONNECTOR 1740 — DECK A & B CONTROL INTERFACE ***(For Dolby B NR version only)***

1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

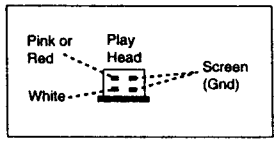
CONNECTOR 1770 — DECK A & B CONTROL INTERFACE ***(For Non-Dolby version only)***

1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

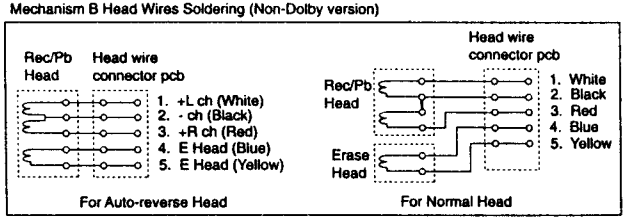
TAPE MECHANISM ELECTRONICS



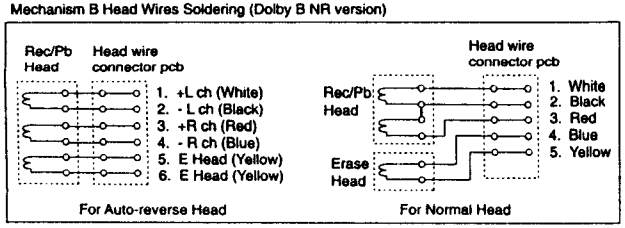
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)



9-5

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	① or ② LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	① or ② LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	① or ② LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST DOLBY PLAYBACK LEVEL *						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	⑦ or ⑧ LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	① or ② LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only

\# For Auto-reverse version only

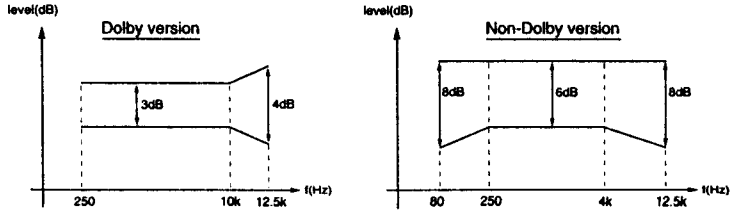


figure. 1

Recording

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
DECK B	CrO_2	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
					3785 *	left = right
	FERRO				check only	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check only	limits see fig.2
Inject 1kHz 8.85mV via ◇3 or ◇4	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high increase bias and re-measure.						
ADJUST DOLBY RECORD LEVEL *						
Inject 400Hz 8.85mV via ◇3 or ◇4	CrO_2	RECORD	◇9 or ◇10 LEFT RIGHT	mV-meter	3655 & 3556	420mV
	RECORDED CASSETTE	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	check	170mV ± 1dB
Remark: If measured value is out, re-adjust record level up or down slightly to attain play level.						

* For Dolby version only

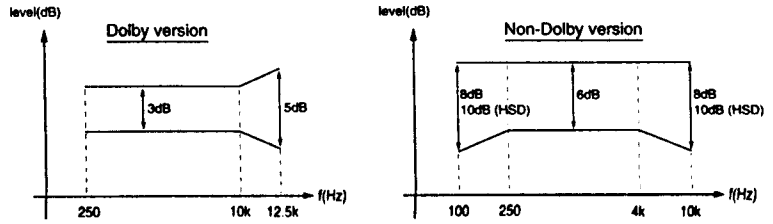
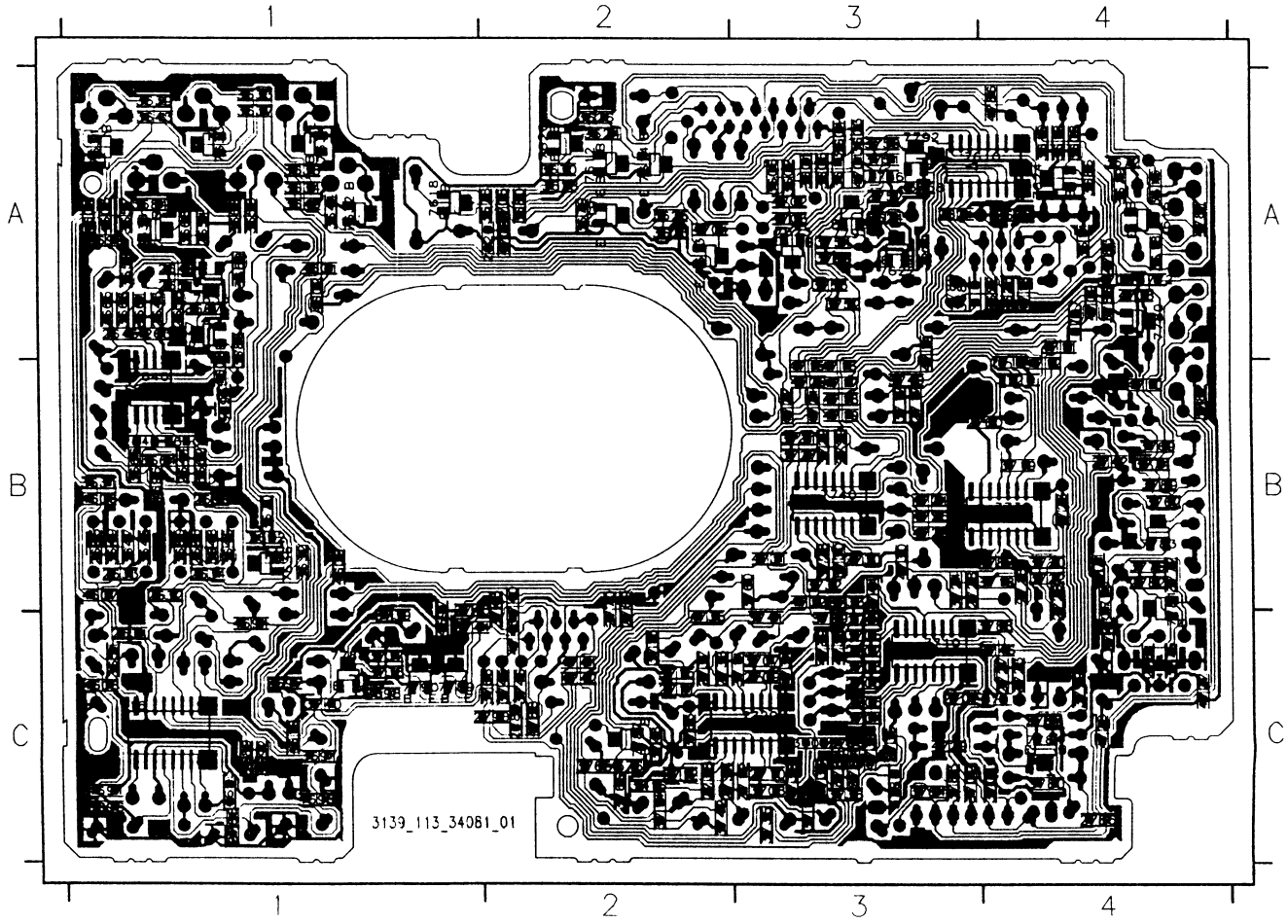


figure. 2

9-6

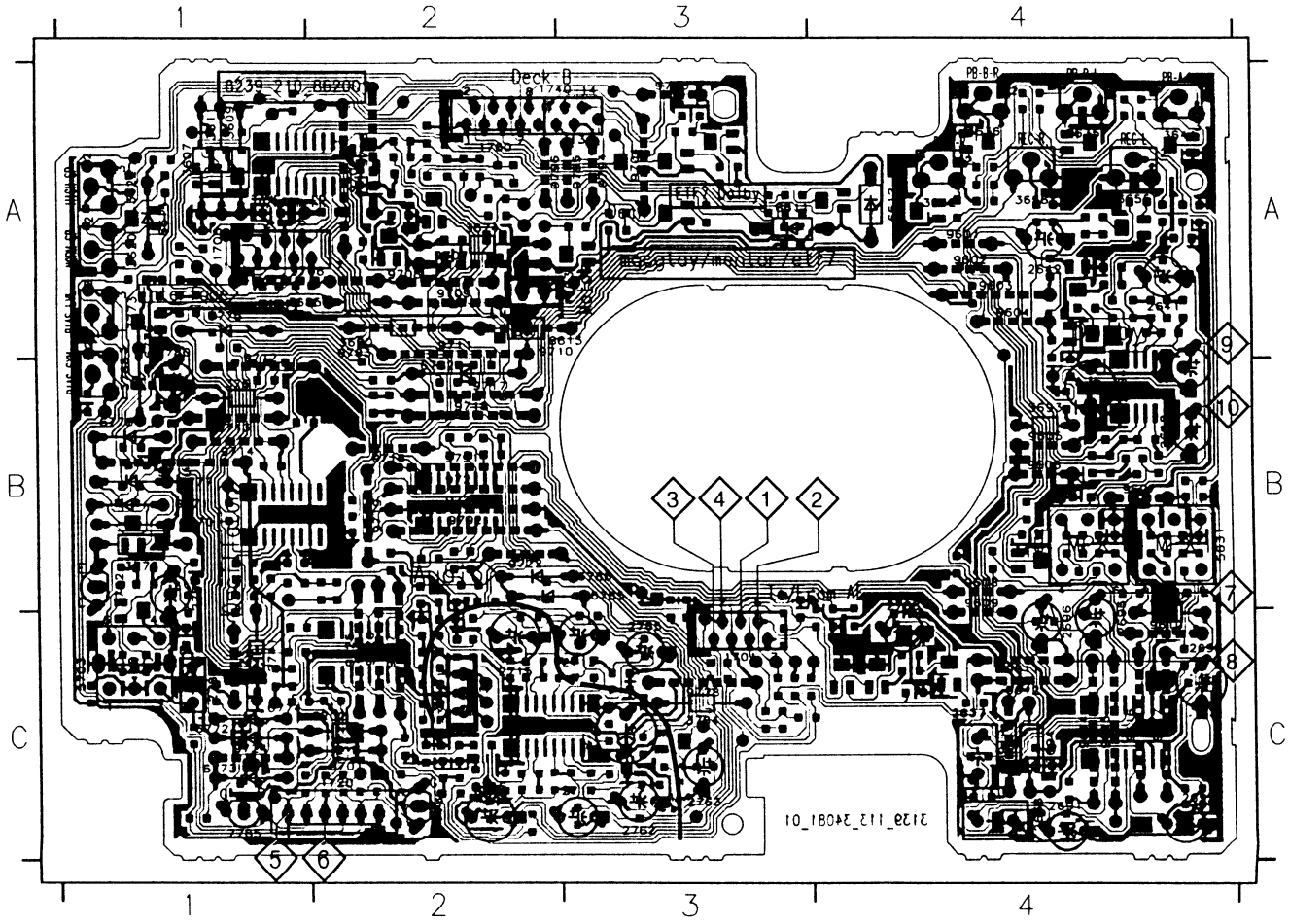
CHIP LAYOUT

2621 A3	2699 A1	2742 B4	3616 A4	3657 A1	3695 B1	3727 B3	3755 A3	3786 A4	4707 A4	4733 C3	7623 A3
2622 A4	2701 C4	2743 C4	3618 A4	3658 A1	3696 C1	3728 B3	3756 A3	3787 A4	4708 A4	4734 C3	7624 A4
2623 A4	2702 C3	2744 B3	3619 A4	3659 A1	3701 C4	3729 B3	3757 A3	3788 C4	4709 A4	4735 C2	7630 C1
2624 A3	2703 C3	2745 B1	3623 A2	3660 A1	3702 C3	3730 B3	3758 A3	3789 B4	4710 B4	4736 C3	7631 A1
2625 A4	2704 C3	2746 C4	3624 A2	3661 A1	3703 C3	3731 B3	3759 A3	4601 A1	4711 A4	4737 C3	7632 A1
2626 A2	2705 C3	2760 B4	3625 A2	3662 B1	3704 C3	3732 B3	3760 B3	4602 A1	4712 B4	4738 C3	7633 A1
2631 C1	2706 C3	2769 B2	3626 A2	3663 A1	3705 C3	3733 B3	3762 B4	4603 A1	4713 A4	4739 C3	7634 A1
2632 B1	2707 C3	2770 B2	3628 A2	3664 B1	3706 C3	3734 C3	3763 C2	4604 A1	4714 A3	4740 B2	7635 A1
2633 B1	2708 C3	2781 C4	3630 A2	3665 A1	3707 C3	3735 C3	3765 C2	4605 B1	4715 B3	4741 C2	7636 B1
2634 B1	2709 C3	2782 B4	3631 B1	3666 B1	3708 C3	3736 C3	3766 C2	4606 B1	4716 B3	4742 C2	7637 A1
2635 B1	2710 C3	2786 C4	3632 B1	3667 A1	3709 C3	3737 C1	3767 C2	4607 B1	4717 B3	4743 C2	7638 A1
2636 B1	2711 C2	2787 C4	3633 A1	3668 A1	3710 C3	3738 C1	3768 C2	4608 C1	4718 B3	4781 A4	7640 B1
2639 A1	2712 C2	2788 C1	3634 A1	3669 A1	3711 C3	3739 C1	3769 B4	4609 B1	4719 B3	4783 A4	7710 C3
2640 B1	2717 B3	2789 C2	3637 A1	3670 B1	3712 C3	3740 C1	3770 B4	4610 C1	4720 B3	4785 A3	7720 C3
2643 A1	2718 B4	2790 C2	3638 A1	3672 A4	3713 C2	3741 C3	3771 B4	4691 C1	4721 B3	4786 A4	7730 B4
2644 B1	2719 B4	3601 A3	3639 A1	3676 A3	3714 C2	3742 C2	3772 A4	4693 C1	4722 B3	4787 B4	7740 B3
2645 A1	2720 B4	3602 A3	3640 A1	3678 A2	3715 C2	3743 B2	3774 B4	4694 C1	4723 B4	4788 C2	7780 A4
2646 B1	2727 C4	3603 A3	3643 A1	3679 A2	3716 C2	3744 C1	3775 C4	4695 C1	4724 B3	7610 A4	7781 B4
2649 A1	2728 B3	3604 A3	3644 A1	3680 A2	3717 B3	3745 C2	3776 B4	4696 B1	4725 B3	7612 A2	7783 B4
2650 B1	2729 B3	3605 A3	3645 B1	3683 A1	3718 B4	3746 C2	3777 B4	4697 C1	4726 B3	7613 A2	7784 C4
2651 A1	2730 B3	3606 A3	3646 B1	3684 A1	3719 B4	3748 C2	3779 C4	4701 A3	4727 C4	7614 A2	7787 C2
2652 B1	2733 C2	3608 A4	3647 B1	3686 A4	3720 B4	3749 B3	3780 C4	4702 A3	4728 C4	7616 A4	7788 C1
2653 A1	2734 C2	3610 A4	3648 B1	3687 A3	3721 B4	3751 A3	3781 C3	4703 A3	4729 C3	7618 A1	7789 C1
2654 A1	2735 C3	3612 A4	3649 B1	3689 C1	3722 B4	3752 A3	3782 B4	4704 A2	4730 B3	7619 A2	7790 C1
2697 C1	2737 C2	3613 A3	3650 B1	3691 C1	3723 C4	3753 A3	3783 C3	4705 A2	4731 B3	7620 A2	7791 A3
2698 C1	2738 C2	3614 A4	3651 C1	3692 C1	3724 B3	3754 A3	3784 C3	4706 A2	4732 B3	7622 A3	7792 A3



COMPONENT LAYOUT

1701 C3	2647 B4	2716 C2	3609 A1	3674 A2	5632 B4	6773 C1	7786 C2	9611 C4	9706 A1	9717 B2	9728 C3
1703 A3	2648 B4	2741 C1	3611 A1	3685 A1	5701 C2	6774 C1	9601 A4	9612 C4	9707 A2	9718 B2	9791 B2
1706 A1	2691 C4	2761 C3	3620 A1	3690 A2	5702 C2	6775 A1	9602 A4	9613 C4	9708 A2	9719 B2	9792 B2
1720 C2	2692 C4	2762 C3	3622 A1	3693 B4	5703 C1	6776 A1	9603 A4	9614 C4	9709 A2	9720 B2	9793 A2
1730 C2	2693 C4	2763 C3	3635 A4	3694 C4	6611 A3	6777 B1	9604 A4	9615 C4	9710 A2	9721 B2	9794 A3
1740 A2	2694 B4	2765 C3	3636 A4	3761 B1	6612 A4	6778 B1	9605 B4	9616 C4	9711 A2	9722 B2	9795 A3
1760 A2	2695 C4	2768 B4	3641 A4	3764 C3	6613 A3	6782 B2	9606 B4	9617 C4	9712 A1	9723 C1	9796 A2
2637 C4	2696 C4	2780 A1	3642 A4	3773 A1	6614 A1	6785 B3	9607 B4	9702 A2	9713 B1	9724 C1	
2638 C4	2713 C3	2784 C1	3652 B4	3778 B1	6770 B1	6786 B3	9608 B4	9703 A2	9714 B1	9725 C2	
2641 A4	2714 C3	2785 B1	3655 A4	3785 B1	6771 B1	7782 B1	9609 B4	9704 A3	9715 B1	9726 C2	
2642 A4	2715 C2	3607 A1	3656 A4	5631 B4	6772 C1	7785 C1	9610 C4	9705 A3	9716 B2	9727 C2	



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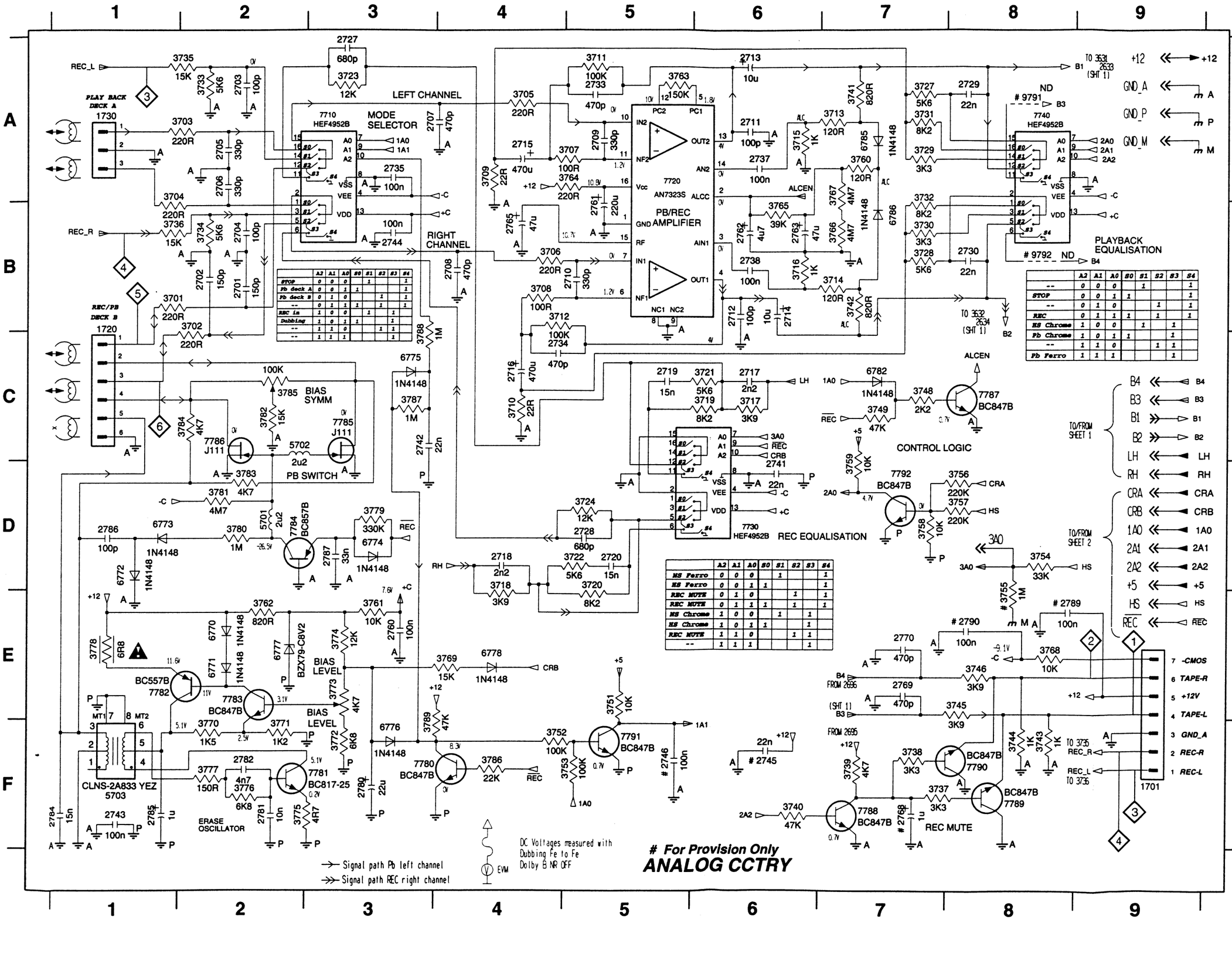
ANALOG CIRCUIT



	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1			1
Dubbing	1	0	1	1				1
--	1	1	0				1	1
--	1	1	1					1

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0				1	1
Pb Ferro	1	1	1					1

	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
NS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

1701 F9	3720 D5	6775 C3
1720 C1	3721 C6	6776 F3
1730 A1	3722 D5	6777 E2
2701 B2	3723 A3	6778 E4
2702 B2	3724 D5	6782 C7
2703 A2	3727 A7	6785 A7
2704 B2	3728 B7	6786 B7
2705 A2	3729 A7	7710 A3
2706 A2	3730 B7	7720 A5
2707 A3	3731 A7	7730 D6
2708 B4	3732 A7	7740 A8
2709 A5	3733 A2	7780 F4
2710 B5	3734 B2	7781 F3
2711 A6	3735 A2	7782 E1
2712 B6	3736 B1	7783 E2
2713 A6	3737 F7	7784 D2
2714 B6	3738 F7	7785 C3
2715 A4	3739 F7	7786 C2
2716 C4	3740 F6	7787 C8
2717 C6	3741 A7	7788 F7
2718 D4	3742 B7	7789 F8
2719 C5	3743 F8	7790 F8
2720 D5	3744 F8	7791 F5
2727 A3	3745 E8	7792 D7
2728 D5	3746 E8	9791 A8
2729 A8	3748 C7	9792 B8
2730 B8	3749 C7	
2733 A5	3751 E5	
2734 C4	3752 F4	
2735 A3	3753 F5	
2737 A6	3754 D8	
2738 B6	3755 E8	
2741 D6	3756 D8	
2742 C3	3757 D8	
2743 F1	3758 D7	
2744 B3	3759 D7	
2745 F6	3760 A7	
2746 F5	3761 E3	
2760 E3	3762 E2	
2761 B5	3763 A5	
2762 B6	3764 A5	
2763 B6	3765 B6	
2765 B4	3766 B7	
2768 F7	3767 A7	
2769 E7	3768 E8	
2770 E7	3769 E4	
2780 F3	3770 F2	
2781 F2	3771 F2	
2782 F2	3772 F3	
2784 F1	3773 E3	
2785 F1	3774 E3	
2786 D1	3775 F2	
2787 D3	3776 F2	
2789 E8	3777 F2	
2790 E8	3778 E1	
3701 B1	3779 D3	
3702 B2	3780 D2	
3703 A2	3781 D2	
3704 A1	3782 C2	
3705 A4	3783 D2	
3706 B4	3784 C2	
3707 A5	3785 C2	
3708 B4	3786 F4	
3709 A4	3787 C3	
3710 C4	3788 C3	
3711 A5	3789 F3	
3712 B4	5701 D2	
3713 A7	5702 C2	
3714 B7	5703 F1	
3715 A6	6770 E2	
3716 B6	6771 E2	
3717 C6	6772 D1	
3718 D4	6773 D1	
3719 C6	6774 D3	

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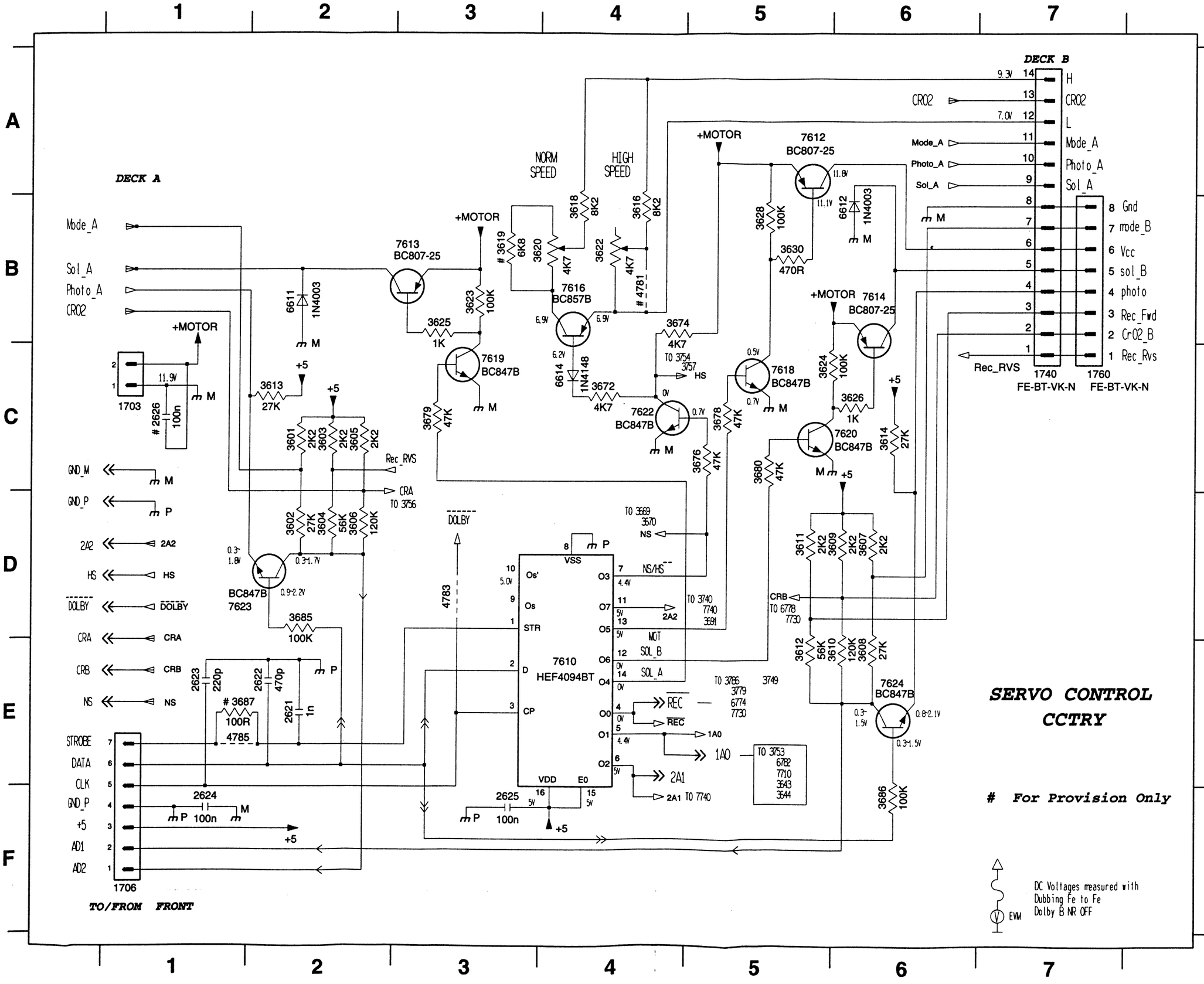
ERVO CONTROL CIRCUIT



1703 C1
1706 F1
1740 C7
1760 C7
2621 E2
2622 E2
2623 E1
2624 F1
2625 F3
2626 C1
3601 C2
3602 D2
3603 C2
3604 D2
3605 C2
3606 D2
3607 D6
3608 E6
3609 D6
3610 E6
3611 D5
3612 E5
3613 C2
3614 C6
3616 B4
3618 B4
3619 B3
3620 B3
3622 B4
3623 B3
3624 C5
3625 B3
3626 C6
3628 B5
3630 B5
3672 C4
3674 B4
3676 C5
3678 C5
3679 C3
3680 C5
3685 D2
3686 F6
3687 E1
4781 B4
4783 D3
4785 E1
6611 B2
6612 B6
6614 C4
7610 E4
7612 A5
7613 B2
7614 B6
7616 B4
7618 C5
7619 C3
7620 C6
7622 C4
7623 D1
7624 E6

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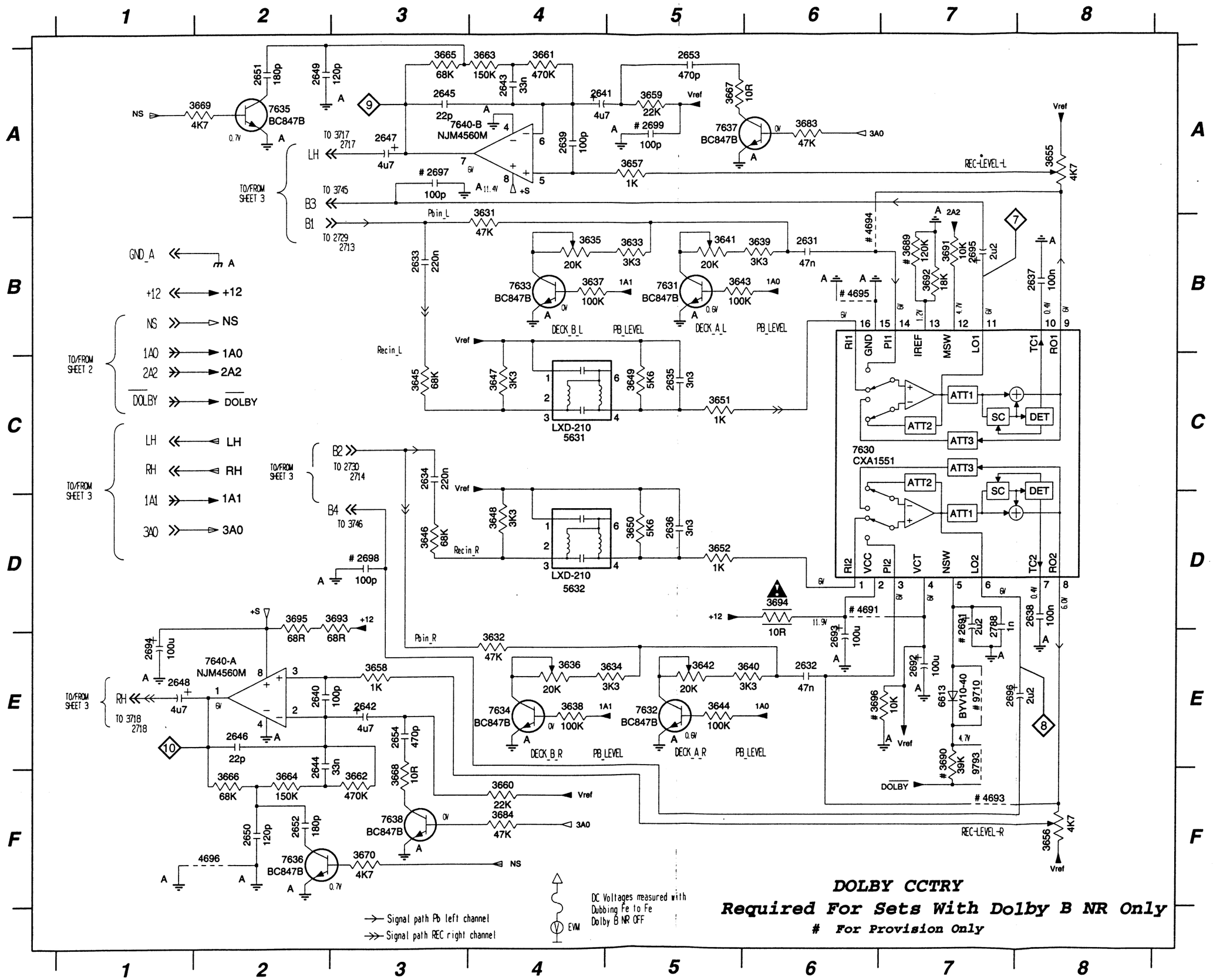
DOLBY CIRCUIT



2631 B6
2632 E6
2633 B3
2634 C3
2635 C5
2636 D5
2637 B8
2638 D8
2639 A4
2640 E2
2641 A4
2642 E3
2643 A4
2644 E2
2645 A3
2646 E2
2647 A3
2648 E1
2649 A2
2650 F2
2651 A2
2652 F2
2653 A5
2654 E3
2691 D7
2692 E7
2693 E6
2694 E1
2695 B7
2696 E7
2697 A3
2698 D3
2699 A5
2788 D7
3631 B4
3632 E4
3633 B5
3634 E5
3635 B4
3636 E4
3637 B4
3638 E4
3639 B6
3640 E6
3641 B5
3642 E5
3643 B5
3644 E5
3645 C3
3646 D3
3647 C4
3648 D4
3649 C5
3650 D5
3651 C5
3652 D5
3655 A8
3656 F8
3657 A5
3658 E3
3659 A5
3660 F4
3661 A4
3662 F3
3663 A4
3664 F2
3665 A3
3666 F2
3667 A5
3668 F3
3669 A2
3670 F3
3683 A6
3684 F4
3689 B7
3690 E7
3691 B7
3692 B7
3693 D3
3694 D6
3695 D2
3696 E6
4691 D6
4693 F7
4694 B6
4695 B6
4696 F2
5631 C4
5632 D4
6613 E7
7630 C6
7631 B5
7632 E5
7633 B4
7634 E4
7635 A2
7636 F2
7637 A5
7638 F3
7640-A E2
7640-B A4
9710 E7
9793 E7

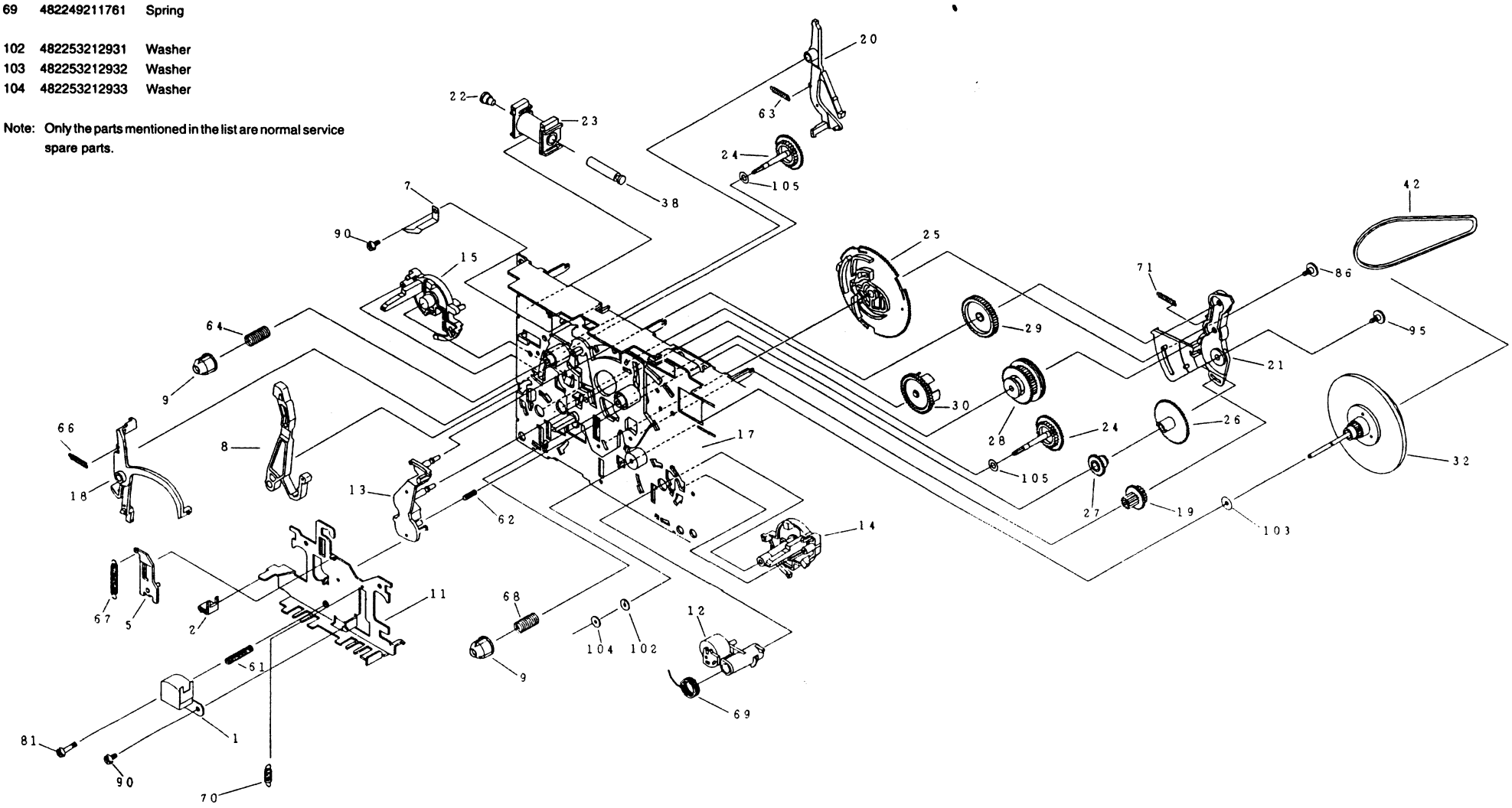
9-10

TAPE MECHANISM A - PLAY

MECHANICAL PARTS - PLAY MECHANISM

1	996500002313	Play Head (Non-Autoreverse deck)
1	996500002321	Play Head (Autoreverse deck)
12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
42	996500002315	Belt AF (Autoreverse deck)
42	996500002718	Belt AF (Non-autoreverse deck)
69	482249211761	Spring
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



PCS 103 382

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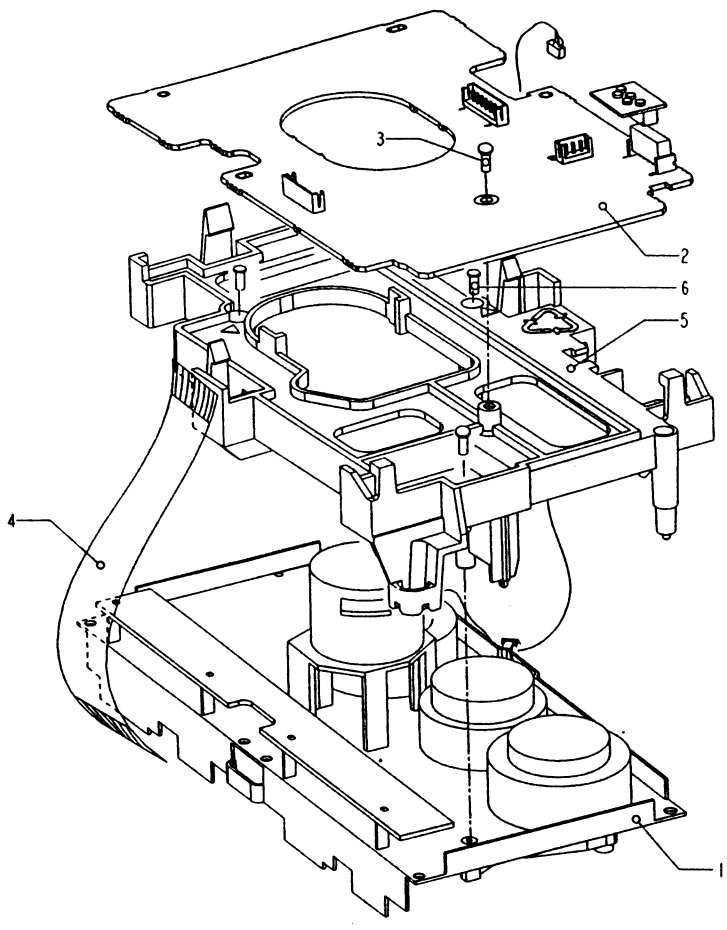
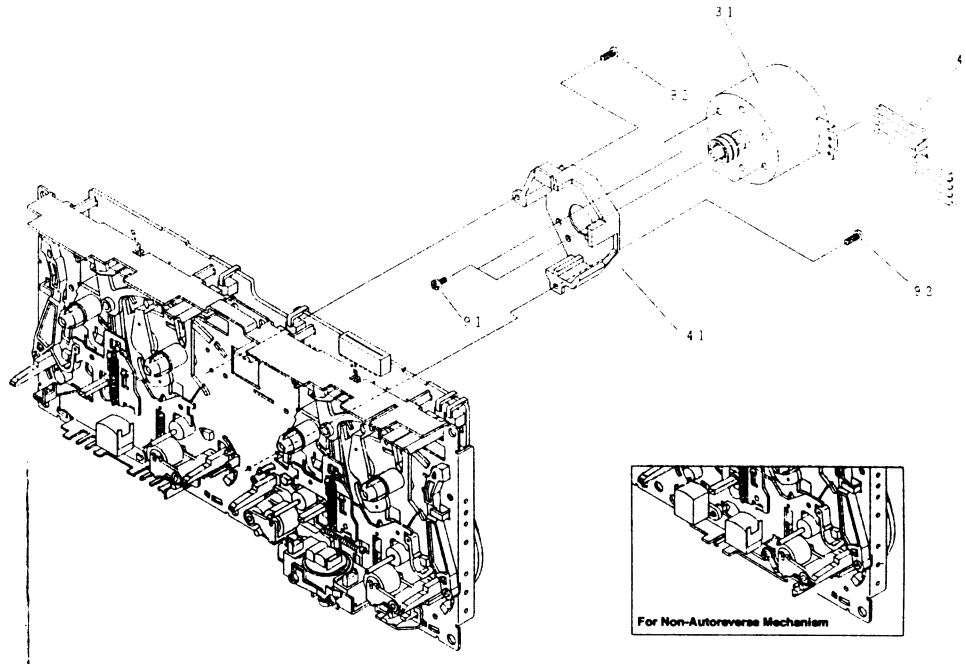


TAPE MODULE EXPLODED VIEW

1	313911877150	Autoreverse Mech. CWE44FR03
3	-	Screw D3 x 10
4	313911034080	Flex Cable 14 pin 7,5 cm
6	-	Screw M2 x 16

Note: Only the parts mentioned in this list are normal service spare parts.



TAPE MECHANISM - MOTOR EXPLODED VIEW

31	996500003006	Motor Assembly
91	-	Screw M2,6 x 5
92	-	Screw M2 x 5

Note: Only the parts mentioned in this list are normal service spare parts.

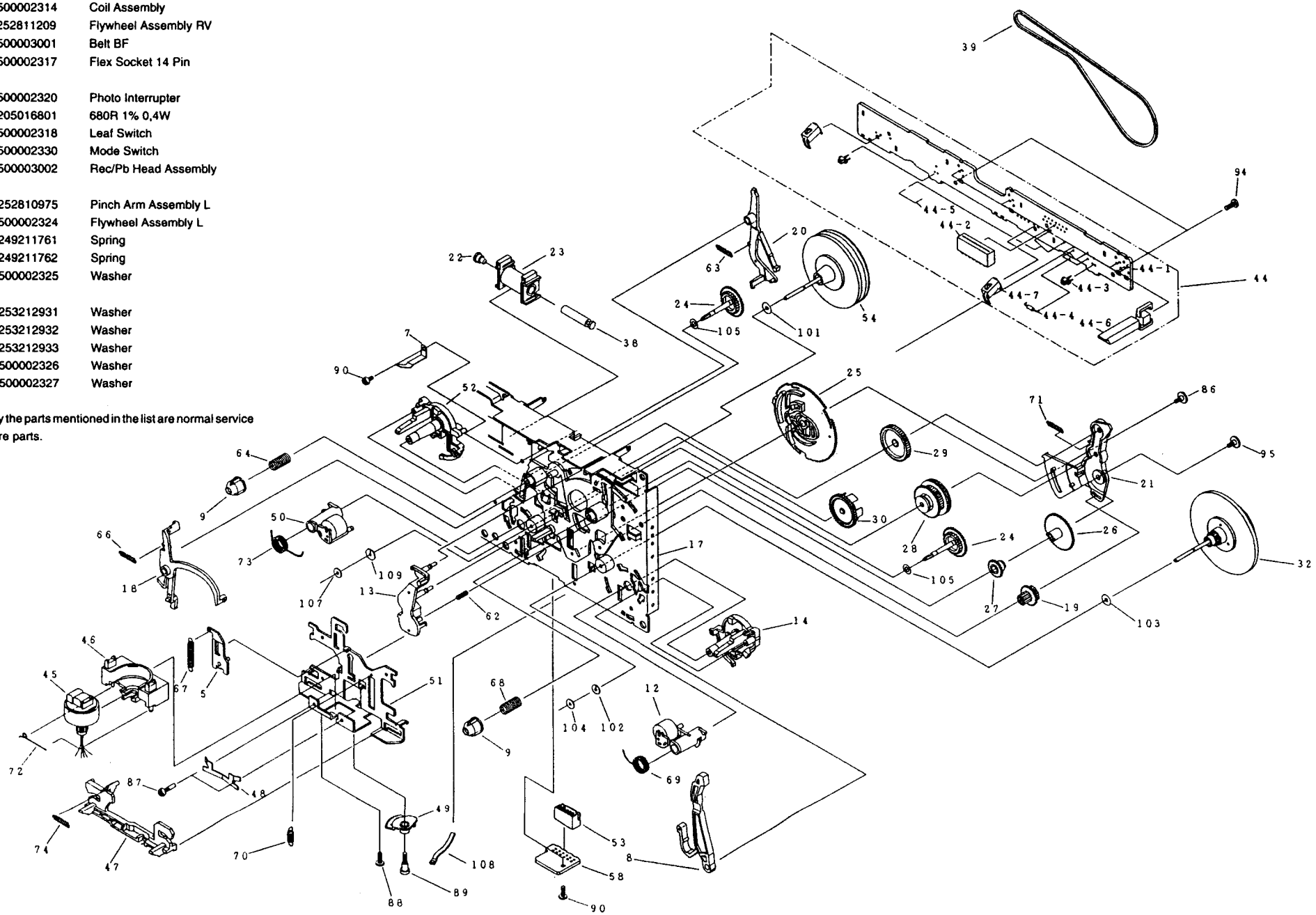
9-12

TAPE MECHANISM B - RECORD/PLAYBACK *(Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
39	996500003001	Belt BF
44-2	996500002317	Flex Socket 14 Pin
44-3	996500002320	Photo Interrupter
44-4	482205016801	680R 1% 0,4W
44-6	996500002318	Leaf Switch
44-7	996500002330	Mode Switch
45	996500003002	Rec/Pb Head Assembly
50	482252810975	Pinch Arm Assembly L
54	996500002324	Flywheel Assembly L
69	482249211761	Spring
73	482249211762	Spring
101	996500002325	Washer
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer
107	996500002326	Washer
109	996500002327	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



ELECTRICAL PARTS LIST - ETF7 DOLBY BOARD

MISCELLANEOUS

1701	482226710953	Flex Connector 7P
1706	482226710953	Flex Connector 7P
1740	482226751255	Flex Connector 14P

CAPACITORS

2621	532212231647	1nF 10% 63V
2622	532212234099	470pF 10% 63V
2623	482212233575	220pF 5% 63V
2624	482212614585	100nF 10% 50V
2625	482212614585	100nF 10% 50V
2631	482212613751	47nF 10% 63V
2632	482212613751	47nF 10% 63V
2633	482212613473	220nF +80/-20% 50V
2634	482212613473	220nF +80/-20% 50V
2635	482212233891	3,3nF 10% 63V
2636	482212233891	3,3nF 10% 63V
2637	532212142386	100nF 5% 63V
2638	532212142386	100nF 5% 63V
2639	532212232531	100pF 5% 50V
2640	532212232531	100pF 5% 50V
2641	482212440769	4,7µF 20% 100V
2642	482212440769	4,7µF 20% 100V
2643	482212612105	33nF 5% 50V
2644	482212612105	33nF 5% 50V
2645	532212232658	22pF 5% 50V
2646	532212232658	22pF 5% 50V
2647	482212440769	4,7µF 20% 100V
2648	482212440769	4,7µF 20% 100V
2649	532212233861	120pF 10% 50V
2650	532212233861	120pF 10% 50V
2651	482212610326	180pF 5% 63V
2652	482212610326	180pF 5% 63V
2653	532212234099	470pF 10% 63V
2654	532212234099	470pF 10% 63V
2692	482212441584	100µF 20% 10V
2693	482212440207	100µF 20% 25V
2694	482212440207	100µF 20% 25V
2695	482212422652	2,2µF 20% 50V
2696	482212422652	2,2µF 20% 50V
2701	532212233538	150pF 2% 63V
2702	532212233538	150pF 2% 63V
2703	532212232531	100pF 5% 50V
2704	532212232531	100pF 5% 50V
2705	532212231863	330pF 5% 63V
2706	532212231863	330pF 5% 63V
2707	532212234099	470pF 10% 63V
2708	532212234099	470pF 10% 63V
2709	532212231863	330pF 5% 63V
2710	532212231863	330pF 5% 63V
2711	532212232531	100pF 5% 50V
2712	532212232531	100pF 5% 50V
2713	482212440248	10µF 20% 63V
2714	482212440248	10µF 20% 63V
2715	482212480195	470µF 20% 10V
2716	482212480195	470µF 20% 10V
2717	482212233127	2,2nF 10% 63V
2718	482212233127	2,2nF 10% 63V
2719	482212613188	15nF 5% 63V
2720	482212613188	15nF 5% 63V
2727	482212232535	680pF 10% 63V
2728	482212232535	680pF 10% 63V
2729	532212232654	22nF 10% 63V
2730	532212232654	22nF 10% 63V
2733	532212234099	470pF 10% 63V
2734	532212234099	470pF 10% 63V
2735	482212614585	100nF 10% 50V
2737	482212614585	100nF 10% 50V
2738	482212614585	100nF 10% 50V
2741	482212611585	22nF +80/-20% 25V
2742	532212232654	22nF 10% 63V
2743	482212614585	100nF 10% 50V
2744	482212614585	100nF 10% 50V
2760	482212614585	100nF 10% 50V
2761	482212480144	220µF 20% 25V
2762	482212440769	4,7µF 20% 100V
2763	482212440433	47µF 20% 25V
2765	482212440433	47µF 20% 25V
2769	532212234099	470pF 10% 63V
2770	532212234099	470pF 10% 63V
2780	482212481151	22µF 50V
2781	482212233177	10nF 20% 50V
2782	532212610223	4,7nF 10% 63V
2784	482212151305	15nF 10% 50V
2785	482212421913	1µF 20% 63V
2786	532212232531	100pF 5% 50V
2787	482212612105	33nF 5% 50V
2788	532212231647	1nF 10% 63V

RESISTORS

3601	482211711449	2k2 1% 0,1W
3602	482205120273	27k 5% 0,1W
3603	482211711449	2k2 1% 0,1W
3604	482211711148	56k 1% 0,1W
3605	482211711449	2k2 1% 0,1W
3606	482205120124	120k 5% 0,1W
3607	482211652256	2k2 5% 0,5W
3608	482205120273	27k 5% 0,1W
3609	482211652256	2k2 5% 0,5W
3610	482205120124	120k 5% 0,1W
3611	482211652256	2k2 5% 0,5W
3612	482211711148	56k 1% 0,1W
3613	482205120273	27k 5% 0,1W
3614	482205120273	27k 5% 0,1W
3616	482205120822	8k2 5% 0,1W
3618	482205120822	8k2 5% 0,1W
3620	482210012227	4k7 30% 0,1W
3622	482210012227	4k7 30% 0,1W
3623	482211710837	100k 1% 0,1W
3624	482211710837	100k 1% 0,1W
3625	482205110102	1k 2% 0,25W
3626	482205110102	1k 2% 0,25W
3628	482211710837	100k 1% 0,1W
3630	482205120471	470R 5% 0,1W
3631	482211710834	47k 1% 0,1W
3632	482211710834	47k 1% 0,1W
3633	482205120332	3k3 5% 0,1W
3634	482205120332	3k3 5% 0,1W
3635	482210011771	20k 30% 0,1W
3636	482210011771	20k 30% 0,1W
3637	482211710837	100k 1% 0,1W
3638	482211710837	100k 1% 0,1W
3639	482205120332	3k3 5% 0,1W
3640	482205120332	3k3 5% 0,1W
3641	482210011771	20k 30% 0,1W
3642	482210011771	20k 30% 0,1W
3643	482211710837	100k 1% 0,1W
3644	482211710837	100k 1% 0,1W
3645	482205120683	68k 5% 0,1W
3646	482205120683	68k 5% 0,1W
3647	482205120332	3k3 5% 0,1W
3648	482205120332	3k3 5% 0,1W
3649	482205120562	5k6 5% 0,1W
3650	482205120562	5k6 5% 0,1W
3651	482205110102	1k 2% 0,25W
3652	482205011002	1k 1% 0,4W
3655	482210012227	4k7 30% 0,1W
3656	482210012227	4k7 30% 0,1W
3657	482205110102	1k 2% 0,25W
3658	482205110102	1k 2% 0,25W
3659	482205120223	22k 5% 0,1W
3660	482205120223	22k 5% 0,1W
3661	482205120474	470k 5% 0,1W
3662	482205120474	470k 5% 0,1W
3663	482205120154	150k 5% 0,1W
3664	482205120154	150k 5% 0,1W
3665	482205120683	68k 5% 0,1W
3666	482205120683	68k 5% 0,1W
3667	482205120109	10R 5% 0,1W
3668	482205120109	10R 5% 0,1W
3669	482205120472	4k7 5% 0,1W
3670	482205120472	4k7 5% 0,1W
3672	482205120472	4k7 5% 0,1W
3674	482211652283	4k7 5% 0,5W
3676	482211710834	47k 1% 0,1W
3678	482211710834	47k 1% 0,1W
3679	482211710834	47k 1% 0,1W
3680	482211710834	47k 1% 0,1W
3683	482211710834	47k 1% 0,1W
3684	482211710834	47k 1% 0,1W
3685	482211652234	100k 5% 0,5W
3686	482211710837	100k 1% 0,1W
3691	482211710833	10k 1% 0,1W
3692	482211710965	18k 1% 0,1W
3693	482211652199	68R 5% 0,5W
3694	482205210109	Δ 10R 5% 0,33W
3695	482211712521	68R 1% 0,1W
3701	482211711503	220R 1% 0,1W
3702	482211711503	220R 1% 0,1W
3703	482211711503	220R 1% 0,1W
3704	482211711503	220R 1% 0,1W
3705	482211711503	220R 1% 0,1W
3706	482211711503	220R 1% 0,1W
3707	482205120101	100R 5% 0,1W
3708	482205120101	100R 5% 0,1W
3709	482205120229	22R 5% 0,1W
3710	482205120229	22R 5% 0,1W
3711	482211710837	100k 1% 0,1W
3712	482211710837	100k 1% 0,1W
3713	482205120121	120R 5% 0,1W
3714	482205120121	120R 5% 0,1W
3715	482205110102	1k 2% 0,25W
3716	482205110102	1k 2% 0,25W
3717	482205120392	3k9 5% 0,1W
3718	482205120392	3k9 5% 0,1W
3719	482205120822	8k2 5% 0,1W
3720	482205120822	8k2 5% 0,1W
3721	482205120562	5k6 5% 0,1W
3722	482205120562	5k6 5% 0,1W
3723	482211711383	12k 1% 0,1W
3724	482211711383	12k 1% 0,1W
3727	482205120562	5k6 5% 0,1W
3728	482205120562	5k6 5% 0,1W
3729	482205120332	3k3 5% 0,1W
3730	482205120332	3k3 5% 0,1W
3731	482205120822	8k2 5% 0,1W
3732	482205120822	8k2 5% 0,1W
3733	482205120562	5k6 5% 0,1W
3734	482205120562	5k6 5% 0,1W
3735	482211683933	15k 1% 0,1W
3736	482211683933	15k 1% 0,1W
3737	482205120332	3k3 5% 0,1W
3738	482205120332	3k3 5% 0,1W
3739	482205120472	4k7 5% 0,1W
3740	482211710834	47k 1% 0,1W
3741	482211711454	820R 1% 0,1W
3742	482211711454	820R 1% 0,1W
3743	482205110102	1k 2% 0,25W
3744	482205110102	1k 2% 0,25W

RESISTORS

3745	482205120392	3k9 5% 0,1W
3746	482205120392	3k9 5% 0,1W
3748	482211711449	2k2 1% 0,1W
3749	482211710834	47k 1% 0,1W
3751	482211710833	10k 1% 0,1W
3752	482211710837	100k 1% 0,1W
3753	482211710837	100k 1% 0,1W
3754	482205120333	33k 5% 0,1W
3756	482211713579	220k 1% 0,1W
3757	482211713579	220k 1% 0,1W
3758	482211710833	10k 1% 0,1W
3759	482211710833	10k 1% 0,1W
3760	482205120121	120R 5% 0,1W
3761	482205021003	10k 1% 0,6W
3762	482211711454	820R 1% 0,1W
3763	482205120154	150k 5% 0,1W
3764	482211683872	220R 5% 0,5W
3765	482205120393	39k 5% 0,1W
3766	482205120475	4M7 5% 0,1W
3767	482205120475	4M7 5% 0,1W
3768	482211710833	10k 1% 0,1W
3769	482211683933	15k 1% 0,1W
3770	482211711139	1k5 1% 0,1W
3771	482205120122	1k2 5% 0,1W
3772	482211711507	6k8 1% 0,1W
3773	482210012227	4k7 30% 0,1W
3774	482211711383	12k 1% 0,1W
3775	482205120478	4R7 5% 0,1W
3776	482211711507	6k8 1% 0,1W
3777	482211710353	150R 1% 0,1W
3778	482205210688 ⚠	6R8 5% 0,33W
3779	482205120334	330k 5% 0,1W
3780	482205120105	1M 5% 0,1W
3781	482205120475	4M7 5% 0,1W
3782	482211683933	15k 1% 0,1W
3783	482205120472	4k7 5% 0,1W
3784	482205120472	4k7 5% 0,1W
3785	532210011539	100k 30% 0,1W
3786	482205120223	22k 5% 0,1W
3787	482205120105	1M 5% 0,1W
3788	482205120105	1M 5% 0,1W
3789	482211710834	47k 1% 0,1W
4601	482205120008	0R Jumper 0805
4602	482205120008	0R Jumper 0805
4603	482205120008	0R Jumper 0805
4604	482205120008	0R Jumper 0805
4605	482205120008	0R Jumper 0805
4606	482205120008	0R Jumper 0805
4607	482205120008	0R Jumper 0805
4608	482205120008	0R Jumper 0805
4610	482205120008	0R Jumper 0805
4696	482205120008	0R Jumper 0805
4697	482205120008	0R Jumper 0805
4701	482205120008	0R Jumper 0805
4702	482205120008	0R Jumper 0805
4703	482205120008	0R Jumper 0805
4704	482205120008	0R Jumper 0805
4705	482205120008	0R Jumper 0805
4706	482205120008	0R Jumper 0805
4707	482205120008	0R Jumper 0805
4708	482205120008	0R Jumper 0805
4709	482205120008	0R Jumper 0805
4710	482205120008	0R Jumper 0805
4711	482205120008	0R Jumper 0805
4712	482205120008	0R Jumper 0805
4713	482205120008	0R Jumper 0805
4714	482205120008	0R Jumper 0805
4715	482205120008	0R Jumper 0805
4716	482205120008	0R Jumper 0805
4717	482205120008	0R Jumper 0805
4718	482205120008	0R Jumper 0805
4719	482205120008	0R Jumper 0805
4720	482205120008	0R Jumper 0805
4721	482205120008	0R Jumper 0805
4722	482205120008	0R Jumper 0805
4723	482205120008	0R Jumper 0805
4724	482205120008	0R Jumper 0805
4725	482205120008	0R Jumper 0805
4726	482205120008	0R Jumper 0805
4727	482205120008	0R Jumper 0805
4728	482205120008	0R Jumper 0805
4729	482205120008	0R Jumper 0805
4730	482205120008	0R Jumper 0805
4731	482205120008	0R Jumper 0805
4732	482205120008	0R Jumper 0805
4733	482205120008	0R Jumper 0805
4734	482205120008	0R Jumper 0805
4735	482205120008	0R Jumper 0805
4736	482205120008	0R Jumper 0805
4737	482205120008	0R Jumper 0805
4738	482205120008	0R Jumper 0805
4739	482205120008	0R Jumper 0805
4740	482205120008	0R Jumper 0805
4741	482205120008	0R Jumper 0805
4742	482205120008	0R Jumper 0805
4743	482205120008	0R Jumper 0805
4783	482205120008	0R Jumper 0805
4785	482205120008	0R Jumper 0805
4786	482205120008	0R Jumper 0805
4787	482205120008	0R Jumper 0805
4788	482205120008	0R Jumper 0805

COILS & FILTERS

5631	482215711865	Filter MPX 20kHz
5632	482215711865	Filter MPX 20kHz
5701	482215711477	Coil 2,2µH 5%
5702	482215711477	Coil 2,2µH 5%
5703	482215620946	Osc. Coil 100kHz

DIODES

6611	482213031878	1N4003G
6612	482213031878	1N4003G
6613	482213032245	BYV10-40
6614	482213030621	1N4148
6770	482213030621	1N4148
6771	482213030621	1N4148
6772	482213030621	1N4148
6773	482213030621	1N4148
6774	482213030621	1N4148
6775	482213030621	1N4148
6776	482213030621	1N4148
6777	482213034382	BZX79-C8V2
6778	482213030621	1N4148
6782	482213030621	1N4148
6785	482213030621	1N4148
6786	482213030621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT
7612	532213060845	BC807-25
7613	532213060845	BC807-25
7614	532213060845	BC807-25
7616	482213060373	BC857B
7618	482213060511	BC847B
7619	482213060511	BC847B
7620	482213060511	BC847B
7622	482213060511	BC847B
7623	482213060511	BC847B
7624	482213060511	BC847B
7630	482220917322	CXA1551M
7631	482213060511	BC847B
7632	482213060511	BC847B
7633	482213060511	BC847B
7634	482213060511	BC847B
7635	482213060511	BC847B
7636	482213060511	BC847B
7637	482213060511	BC847B
7638	482213060511	BC847B
7640	482220983357	NJM4560M
7710	482220932919	HEF4952BT
7720	932214000668	AN7323S
7730	482220932919	HEF4952BT
7740	482220932919	HEF4952BT
7780	482213060511	BC847B
7781	482213042804	BC817-25
7782	482213044568	BC557B
7783	482213060511	BC847B
7784	482213060373	BC857B
7785	482213063494	J111
7786	482213063494	J111
7787	482213060511	BC847B
7788	482213060511	BC847B
7789	482213060511	BC847B
7790	482213060511	BC847B
7791	482213060511	BC847B
7792	482213060511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.